Library
SEP 17 1932

VETERINARY MEDICINE

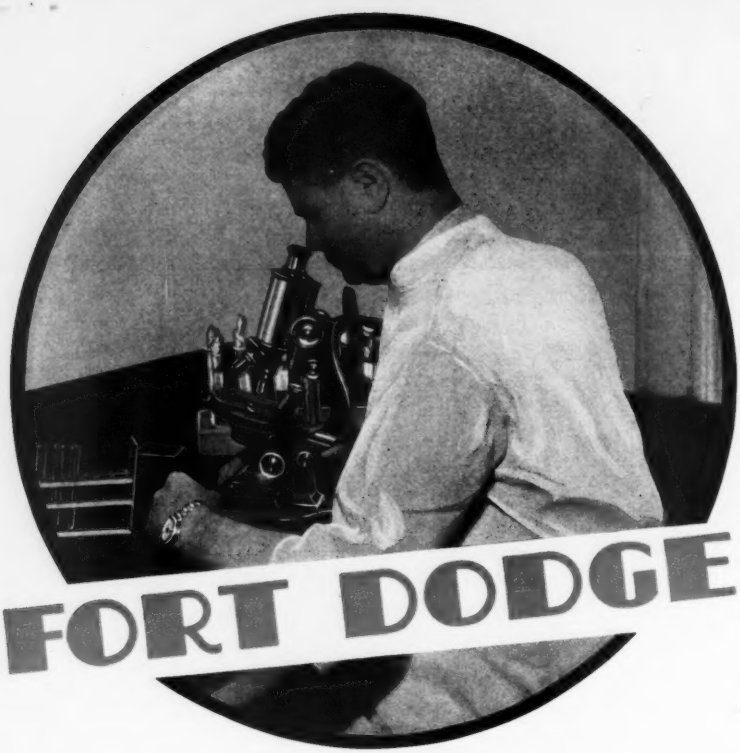
October, 1932

Contents

Meat Inspection 414
Swine Disease Control 420
Clinical Diagnosis in Cattle 426
Morphine for Strychnine Poisoning in Dogs 429
Treatment for Fractures of the Mandible in Dogs 429
The Use of Azamine in Mastitis 430
Veterinarians—Public Health Benefactors 431
Hazards of Surgery in Cattle Feeding on Sweet Clover Hay .. 431
Ano-Vulvitis in Cattle 432
Convulsions in a Boar 434
Live Stock Health and Wealth 435
Digestive Disturbances Due to Peanut Vine Hay 438
Vomition in a Cow 441
Incubator and Hatchery Sanitation and Inspection 442
Atlanta Meeting of the A. V. M. A. 446
Bronchopneumonia Among Horses 452
Pneumonia of Colts Due to Diplococcus 452
Transmissible Fowl Leucosis 452
Fowl Leucosis in Chicks 453
Serological Diagnosis of Anthrax 453
Blood Picture in Diseased Cattle 453
New Type of Rabies in South America 454

No. 10
VOL. XXVII

75 E. Wacker Drive
Chicago, U. S. A.



The advice and counsel of experienced veterinarians in the field is obtained before preparation of a new Fort Dodge pharmaceutical product is begun. ● Then every step in its production is continuously checked by competent pharmaceutical chemists. ● Thus Fort Dodge makes sure its products are practical products for practical veterinarians.

QUALITY · RELIABILITY · SERVICE

Proved practicality, worth and efficiency are attributes of every product that bears the famous Red Star of Fort Dodge.

FORT DODGE SERUM COMPANY
U. S. Veterinary License 112
Fort Dodge, Iowa

Veterinary Medicine

Registered in U. S. Patent Office

VOL. XXVII OCTOBER, 1932 No. 10

Published Monthly by the Veterinary Magazine Corporation
75 East Wacker Drive, Chicago, Ill., U. S. A.
$4.00 a Year

Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of Mar. 3, 1879.
Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under Act of March 3, 1879.

Copyrighted 1931, by Veterinary Magazine Corporation.
All matter appearing in this publication is covered by copyright, and no part of it may be reproduced without permission. Permission will be granted on request for the reproduction of anything in the columns of VETERINARY MEDICINE if the purpose of the reproduction is unobjectionable. Where there is any doubt as to the propriety of reproduction, the wishes of the author will be consulted.

D. M. Campbell, Editor **A. T. Kinsley, Associate Editor**

A public abattoir still in use was erected in Amiens, France, in 1300.

By order of Napoleon, public abattoirs were erected in Paris in 1807.

In Scotland, ordinances were passed regulating meat inspection in the years 1152, 1192 and 1284. In 1892 a law was passed giving local authorities power to erect public abattoirs and forbidding the use of private slaughter houses where abattoirs exist.

The Ayurvedic Book of Medicine contains evidence that anatomy was practiced by the Hindus more than 2,000 years B. C. Galen, who lived during the second century of our era, was a remarkable anatomist. He dissected not human, but animal bodies, particularly monkeys. He was the first of the great anatomists. —*The Bloodless Phlebotomist.*

In 1861 the Upper Canadian Board of Agriculture considered it necessary to take steps to have inaugurated a suitable institution for the education and training of young men as veterinary surgeons. In furtherance of this project, the Ontario Veterinary College was established in 1862 in Toronto as a private enterprise under the direction of the late Principal, Andrew Smith.

Prolonged lactation in cows is sometimes the cause of an objectionable odor and flavor in milk.

Disocorides wrote a Materia Medica in the first century A. D. that remained a recognized authority on drugs for 1,600 years. A Materia Medica ten years old is now regarded as outdated.

Seventy-five per cent of the trouble following the vaccination of swine accrues from vaccinating at a time when the herd is not in a condition to receive such treatment.—Henry Hell.

Copper in contact with milk has been shown to result in the development of a objectionable "card board" flavor. In one instance contact with the copper of the recording thermometer arm resulted in all milk going through the pasteurizer having this objectionable flavor.

A Museum of Antiquities in Copenhagen contains a 30-century-old Egyptian stone upon which are carved the figures of a young prince and his family. The figure of the prince indicates that he had suffered from infantile paralysis. Khnouhmotpon, the younger Egyptian god of perfumes, is shown in ancient Egyptian carvings as an achondroplastic dwarf.

Good veterinary service goes far towards encouraging swine growing. Poor veterinary service means losses and discouragement.—J. W. Benner.

The vices of feather picking and cannibalism in chickens can be effectively prevented by the proper control of light and temperature in the brooding and laying houses.

One of the most persistent mistakes of poultry housing in the past has been the use of too much glass. Glass makes the houses cold at night and hot when the sun shines. Such radical changes of temperature are objectionable and may lead to serious consequences.—Ohio Agricultural Experiment Station.

Putting a live virus in the hands of the untrained man is the greatest outrage ever perpetrated against animal disease control. Why men who stand high in the ranks of the profession should have, in the early days, foisted such a monstrosity upon the live stock industry is beyond comprehension.—H. C. Kernkamp.

Farmer vaccination of swine may be defined as an affliction rather than as a disease of swine, the mortality is sufficiently great to warrant our consideration. Since the advent of granting permits to administer serum and virus to other than qualified veterinarians, we have had to reckon with what is known as farmer or permit-holder vaccination of swine.—Henry Hell.

Milk produced under ordinary conditions is a poor source of Vitamine D, the factor essential for the proper assimilation of the bone building elements, calcium and phosphorus, which are abundant in milk. Studies recently concluded at the Ohio Experiment Station show that the Vitamine D content of milk can be increased many times by feeding irradiated ergosterol to cows.

Regularly dosing sheep and lambs with 1% solution of copper sulphate is an effective method for controlling stomach worms. Dosing every 25 to 30 days in the colder section of the country is effective. In the southern states, the dose should be repeated every two weeks.

The stomach worm, *Haemonchus contortus,* of sheep and lambs is one of the most serious menaces confronting the sheep industry of the United States. It is widespread and its depredations are becoming more intense as flocks increase in numbers or are confined to smaller ranches and farms. As pastures become older the infective parasite material accumulates on them.—E. M. Nighbert.

The present day veterinarian deals with flock and herd problems in food producing animals, as well as individual cases in all species of work and pet animals. He is a specialist in animal diseases and a guardian of the public health in that many infectious animal diseases are transmissible to man by contact or through milk or meat products. He is a sanitarian dealing with problems of preventive medicine through diagnostic tests and often immunization of flocks and herds.—Education in Veterinary Medicine, Iowa State College.

Experimental work in feeding animals, as well as children, has shown that milk occupies a place of unique importance in the diet of the growing young. No other food can take its place completely because no other food reinforces the diet at so many places. During the early months of the first year of life, milk is the principal food of the infant and provides practically all the calories, as well as the other nutrients, needed. As the child becomes older, other foods are added, but milk should continue to form the basis of the diet throughout the entire period of childhood.—Ohio Agricultural Experiment Station.

A French physician has found horse serum more effective for wound dressing than Colodion.—*The Bloodless Phlebot.*

During the Spanish-American war, one soldier in five contracted typhoid fever. Among the troops mobilized on the Texas border in 1916, the morbidity rate for this disease was one in 20,000.

Fatigue has a larger share in the promotion or transmission of disease than any other single causal condition.—Sir James Paget, in *The Bloodless Phlebot.*

In 1928, more than 18,000 deaths in the United States were attributed to appendicitis. In the past half dozen years, there has been an increase of 17% in the death rate from this ailment.

There is among many a nihilistic attitude towards any form of therapy unless it can be demonstrated by laboratory experiments, and yet, clinical experience teaches that relief is often obtained through methods eluding the test tube. —*The Bloodless Phlebotomist.*

There are said to be 2,000 cases of leprosy in the United States at the present time. The disease is transmitted only in Florida, Louisiana, Texas and California. It would be necessary only to send all the afflicted persons of those four states to the federal hospital at Carville, Louisiana, to eradicate the disease from this country.

In Babylonia, the priests were the physicians. Frequently when a patient mistrusted the ability of his priest-doctor or was discouraged with the treatment he was getting, he would have himself brought on a stretcher to the market place, that all passersby might look upon him and offer suggestions as to treatment. Possibly this is the origin of the common custom of offering lay advice on medical subjects.

The people of the United States pay an average of $3.00 per capita for patent medicines bought over the counter without medical advice from any scientific source.

The anterior lobe of the pituitary gland produces two distinct kinds of hormones. One is growth promoting and the other is sex-gland stimulating. Evans of the University of California gave injections of the growth-promoting hormone to a young girl suffering from arrested development (a dwarf) and her height was increased about four inches.

The American people spend annually about $715,000,000 for drugs and medicines and five times that sum for medical, dental and other services specifically related to the care of their health. A little more than one-half of the drug bill goes for what are popularly known as patent remedies bought over the counter by purchasers who have diagnosed their own needs without the benefit of professional advice.

Bulgaria with 12,500,000 domestic animals other than poultry, of which there are 10,000,000, has 600 veterinarians, of which 30 are army officers, 50 are engaged in teaching, 182 are officers in the Department of Agriculture and 40 are area and 14 district veterinary officers. The remaining 280 are men with elementary veterinary education, survivors of the old regime in force before the Russian occupation. In other words, except for these 280 "Revierveterinärfeldscher" all veterinarians in Bulgaria occupy official positions. The veterinary profession has complete control of the inspection of all food of animal origin, cattle houses, markets and slaughter houses. Clinical veterinary surgery and medicine is also on a state basis. There are 366 large and small veterinary clinics in Bulgaria, all conducted by official veterinarians.

Meat Inspection*

By U. G. HOUCK, Washington, District of Columbia
Association Chief of the Bureau of Animal Industry, U. S. Dept. of Agriculture

RECORDS and historical traditions indicate that meat has constituted an important article of human diet as far back as man has been traced. That the dangers from meat as food became recognized at a very early date is apparent from the restrictions placed upon its consumption by the oldest civilized nations, including the early Egyptians, Israelites, Phoenicians, Babylonians, Athenians, and Romans.

Concurrently with the increase in human knowledge of the causes of disease and the ways by which infections are normally transmitted from animals to man, the empirical, ritualistic restrictions of the ancients have developed into an established system of meat inspection based on scientific facts.

History of Federal Meat Inspection in the United States

The United States enjoys the distinction of having established and developed a meat-inspection service which in scope, magnitude, and efficiency is not surpassed by any national meat-inspection system anywhere. This service was inaugurated first as an economic necessity. Our cattle and sheep had been refused admission into Great Britain, and their slaughter was required within two weeks on the docks where they were landed. The explanation was that certain contagious diseases, including contagious pleuropneumonia, existed in this country, which were dangerous to the livestock industry of our foreign neighbors.

The markets of Continental Europe had been closed to our pork products because, it was alleged, they were found to be infested with trichinae, and, therefore, dangerous to the health and lives of our foreign patrons. It was generally felt that the real purpose of the barriers set up by foreign countries was to exclude as far as possible American competition which was more dangerous and feared more than any of the diseases that affected our domestic animals; however, in modern parlance, we were "placed on the spot" and our response was the passage by the Congress of the Act of March 3, 1891, establishing meat inspection in the United States. This Act proved to be too limited in its scope to satisfy our foreign customers and did not in any way meet the needs of our domestic consumers for protection; therefore, this act was followed by the Act of March 2, 1895, and, finally, by the present law of June 30, 1906.

Objective of Meat Inspection

The purpose of our present meat-inspection law is to eliminate diseased or otherwise unfit meat from the general food supply; to require that the preparation and processing of foods, composed wholly or in part of meat, be conducted in a cleanly and sanitary manner; to prevent the use of harmful dyes, preservatives, or other deleterious substances in the curing of meats and the preparation of meat-food products; also to eliminate false and misleading labels and statements in connection with the sale of such foods.

Many people have no exact or definite knowledge of animal diseases and parasitic conditions which alter the character of flesh and make it objectionable and possibly harmful. A large majority of our people are unable to protect themselves against the deteriorative changes that may occur in the flesh of an animal following slaughter. The public seems to take it for granted that the government—national, state, or municipal—is cognizant of the situation and will do for the people those things which they as in-

* Presented at a joint meeting of the North Carolina and the Virginia State Veterinary Medical Associations, Henderson, North Carolina, June 30, 1932.

dividuals are unable to do for themselves in matters of health, including an adequate protection of the food and water supplies. Inasmuch as consumers of meat, with few exceptions, have neither the ability nor the opportunity to make the necessary inspection, it devolves upon the city, the state, or the national government to provide inspection so that the common need shall be met and the necessary protection provided.

Division of Authority in Food Inspection

Under the Constitution the right is reserved to the governments of the various states to regulate and control certain trade activities within their respective borders. Only when such activities extend beyond the borders of a state, i. e. enter into interstate or foreign commerce, does the Federal government have the power of regulation. Under this constitutional limitation the Federal meat-inspection law and the regulations based thereon are applicable only to slaughtering and processing establishments, the products of which, in whole or in part, are intended for interstate or foreign commerce. In order to extend as far as possible the benefits of the Federal meat inspection law, the regulations require that establishments to which inspection has been granted, shall operate their entire plants under Federal meat inspection even though only a relatively small part of the output may be actually transported to another state, territory, or a foreign country. Thus local consumers benefit from this arrangement, but it is estimated that at present the Federal government is able under existing law to apply its inspection to approximately only two-thirds of the total amount of meat prepared and in the main consumed in the United States. This leaves approximately one-third of the domestic meat supply prepared outside of Federal control. The loathsome and dangerous conditions found in the two-thirds of the animals slaughtered for meat certainly show the necessity for extending inspection to the other one-third. To whom shall the defenseless consumers of meat look for protection aginst the loathsome and dangerous conditions to be found in the remaining third of the meat supply?

Prevalence of Animal Disease

It is almost unbelievable that, according to estimates, the annual losses to our livestock industry from common diseases and parasites amount to the enormous sum of approximately 262 million dollars. Our meat-inspection records show that entire carcasses of many animals of the different species are found on post-mortem inspection to be affected with diseases or abnormal conditions to such an extent as to require their condemnation; and parts of many more are condemned after separation from the healthy and fit portions of carcasses.

During the fiscal year ended June 30, 1931, there were slaughtered and inspected at the 334 slaughtering establishments operating under Federal meat inspection, approximately 74 and one-half millions of animals, including 8,208,000 cattle, 4,732,000 calves, 17,300,000 sheep and lambs, 9,000 goats, 44,020,000 swine, and 135,159 horses. On post-mortem inspection the carcasses of 205,143 of these animals and over 900,000 parts, such as heads and livers, were found to be affected with disease and other conditions which rendered the meat unsafe or otherwise unfit for human food, requiring their condemnation. And, in addition, approximately six and three-fourths million pounds of meat and meat-food products were condemned on re-inspection on account of having become sour, tainted, unclean or otherwise unwholesome and unfit for human food. This enormous waste in food will be appreciated when it is realized that the meat and meat-food products condemned last year were sufficient to supply more than half a million people with meat at the present yearly per capita consumption; or the combined populations of Richmond, Norfolk and Atlanta.

More than 40 diseases and conditions are recorded as causes for condemnation. Tuberculosis in cattle and tuberculosis and cholera in swine account for nearly

Meat Inspection*

By U. G. HOUCK, Washington, District of Columbia
Association Chief of the Bureau of Animal Industry, U. S. Dept. of Agriculture

RECORDS and historical traditions indicate that meat has constituted an important article of human diet as far back as man has been traced. That the dangers from meat as food became recognized at a very early date is apparent from the restrictions placed upon its consumption by the oldest civilized nations, including the early Egyptians, Israelites, Phoenicians, Babylonians, Athenians, and Romans.

Concurrently with the increase in human knowledge of the causes of disease and the ways by which infections are normally transmitted from animals to man, the empirical, ritualistic restrictions of the ancients have developed into an established system of meat inspection based on scientific facts.

History of Federal Meat Inspection in the United States

The United States enjoys the distinction of having established and developed a meat-inspection service which in scope, magnitude, and efficiency is not surpassed by any national meat-inspection system anywhere. This service was inaugurated first as an economic necessity. Our cattle and sheep had been refused admission into Great Britain, and their slaughter was required within two weeks on the docks where they were landed. The explanation was that certain contagious diseases, including contagious pleuropneumonia, existed in this country, which were dangerous to the livestock industry of our foreign neighbors.

The markets of Continental Europe had been closed to our pork products because, it was alleged, they were found to be infested with trichinae, and, therefore, dangerous to the health and lives of our foreign patrons. It was generally felt that the real purpose of the barriers set up by foreign countries was to exclude as far as possible American competition which was more dangerous and feared more than any of the diseases that affected our domestic animals; however, in modern parlance, we were "placed on the spot" and our response was the passage by the Congress of the Act of March 3, 1891, establishing meat inspection in the United States. This Act proved to be too limited in its scope to satisfy our foreign customers and did not in any way meet the needs of our domestic consumers for protection; therefore, this act was followed by the Act of March 2, 1895, and, finally, by the present law of June 30, 1906.

Objective of Meat Inspection

The purpose of our present meat-inspection law is to eliminate diseased or otherwise unfit meat from the general food supply; to require that the preparation and processing of foods, composed wholly or in part of meat, be conducted in a cleanly and sanitary manner; to prevent the use of harmful dyes, preservatives, or other deleterious substances in the curing of meats and the preparation of meat-food products; also to eliminate false and misleading labels and statements in connection with the sale of such foods.

Many people have no exact or definite knowledge of animal diseases and parasitic conditions which alter the character of flesh and make it objectionable and possibly harmful. A large majority of our people are unable to protect themselves against the deteriorative changes that may occur in the flesh of an animal following slaughter. The public seems to take it for granted that the government—national, state, or municipal—is cognizant of the situation and will do for the people those things which they as in-

* Presented at a joint meeting of the North Carolina and the Virginia State Veterinary Medical Associations, Henderson, North Carolina, June 30, 1932.

dividuals are unable to do for themselves in matters of health, including an adequate protection of the food and water supplies. Inasmuch as consumers of meat, with few exceptions, have neither the ability nor the opportunity to make the necessary inspection, it devolves upon the city, the state, or the national government to provide inspection so that the common need shall be met and the necessary protection provided.

Division of Authority in Food Inspection

Under the Constitution the right is reserved to the governments of the various states to regulate and control certain trade activities within their respective borders. Only when such activities extend beyond the borders of a state, i. e. enter into interstate or foreign commerce, does the Federal government have the power of regulation. Under this constitutional limitation the Federal meat-inspection law and the regulations based thereon are applicable only to slaughtering and processing establishments, the products of which, in whole or in part, are intended for interstate or foreign commerce. In order to extend as far as possible the benefits of the Federal meat inspection law, the regulations require that establishments to which inspection has been granted, shall operate their entire plants under Federal meat inspection even though only a relatively small part of the output may be actually transported to another state, territory, or a foreign country. Thus local consumers benefit from this arrangement, but it is estimated that at present the Federal government is able under existing law to apply its inspection to approximately only two-thirds of the total amount of meat prepared and in the main consumed in the United States. This leaves approximately one-third of the domestic meat supply prepared outside of Federal control. The loathsome and dangerous conditions found in the two-thirds of the animals slaughtered for meat certainly show the necessity for extending inspection to the other one-third. To whom shall the defenseless consumers of meat look for protection aginst the loathsome and dangerous conditions to be found in the remaining third of the meat supply?

Prevalence of Animal Disease

It is almost unbelievable that, according to estimates, the annual losses to our livestock industry from common diseases and parasites amount to the enormous sum of approximately 262 million dollars. Our meat-inspection records show that entire carcasses of many animals of the different species are found on post-mortem inspection to be affected with diseases or abnormal conditions to such an extent as to require their condemnation; and parts of many more are condemned after separation from the healthy and fit portions of carcasses.

During the fiscal year ended June 30, 1931, there were slaughtered and inspected at the 334 slaughtering establishments operating under Federal meat inspection, approximately 74 and one-half millions of animals, including 8,208,000 cattle, 4,732,000 calves, 17,300,000 sheep and lambs, 9,000 goats, 44,020,000 swine, and 135,159 horses. On post-mortem inspection the carcasses of 205,143 of these animals and over 900,000 parts, such as heads and livers, were found to be affected with disease and other conditions which rendered the meat unsafe or otherwise unfit for human food, requiring their condemnation. And, in addition, approximately six and three-fourths million pounds of meat and meat-food products were condemned on re-inspection on account of having become sour, tainted, unclean or otherwise unwholesome and unfit for human food. This enormous waste in food will be appreciated when it is realized that the meat and meat-food products condemned last year were sufficient to supply more than half a million people with meat at the present yearly per capita consumption; or the combined populations of Richmond, Norfolk and Atlanta.

More than 40 diseases and conditions are recorded as causes for condemnation. Tuberculosis in cattle and tuberculosis and cholera in swine account for nearly

one-half the total condemnations. Such diseases as pneumonia, peritonitis, metritis, enteritis, pleurisy, septicemia, pyemia, and uremia account for nearly one-third of the total. The loss sustained by meat packers from the condemnation of organs and other parts of carcasses on account of changes brought about through parasitic infestation is not generally appreciated. A test conducted at one of the meat-packing establishments located in a Southern state revealed that the loss in hogs amounted to 30 cents for each hog slaughtered. Kidney worms were responsible for most of this loss.

Markets for Diseased Animals

Establishments at which Federal inspection is maintained have endeavored to avoid the loss incident to condemnations by exercising care in the purchase of livestock with the view of excluding animals showing symptoms of ill health. This procedure reduces the losses sustained by official establishments, but tends to divert the sale of diseased and suspected animals to slaughter places that operate without inspection. Livestock producers and traders have learned from experience that it is more profitable to sell their diseased animals, and those which they suspect are diseased, to local country butchers and establishments operating without efficient inspection, than to ship them to public markets where they will be subject to Federal antemortem and post-mortem inspection. The final disposition of meats and products derived from diseased and unfit animals diverted from establishments where Federal inspection is maintained, and slaughtered in uninspected abattoirs and country barns and slaughter houses assumes greater importance from a health standpoint than is usually accorded it.

Furthermore, most of the slaughter houses which operate under no system of inspection are objectionable on account of unsanitary features which are dangerous to the health of consumers of meat due to contamination of the products. In most instances these places are not capable of being kept in a sanitary condition due to their improper location and faulty construction. It has been proposed to build central abattoirs to remedy these objectionable conditions. The concentration of slaughtering at central abattoirs seems to be the most hopeful way to accomplish the objects of efficient meat inspection in towns and most cities where slaughtering and processing operations are not conducted under Federal supervision.

Responsibility of the States

In extending inspection to two-thirds of our meat supply the Federal Government is doing all that it can, under the Constitution and existing laws, to protect the public against the effects of dangerous and unwholesome meat and meat products. In view of our knowledge of the frequency of disease in animals used for food, it is not only desirable but it is the duty of state and municipal governments to provide for the inspection of that portion of our meat supply over which the Federal government has no control. If the public realized fully the benefits of meat inspection, our entire meat supply would now be receiving an efficient Federal, state, or municipal inspection. It seems that in many instances inspection is inaugurated by city boards of health only after the public consciousness has been aroused to the situation through unfortunate deaths from infection traced to meat or through a public exposé of unsanitary conditions found to exist in connection with the local meat supply. Already 42 cities, have ordinances requiring inspection of that part of the local meat supply which is not covered by Federal inspection. This is a step in the right direction, but 42 among approximately 2,700 incorporated towns and cities in the United States having a population of 3,000 or more people falls far short of meeting the present needs, and owing to lack of funds, or other impediments, including political expediency, it cannot be said at present that the inspection in all of the 42 cities is as efficient as it might be. The larger and more

powerful a government organization is, the more likely it is to be in a position to inaugurate and conduct an efficient meat inspection.

Opportunities of the Veterinary Profession

State governments are most powerful and far-reaching in the control of state matters; therefore, a state government should be in the most favorable position to supplement Federal meat inspection, or to cooperate with cities in providing a reliable, efficient service. It is incomprehensible to many why the states have been so slow to take the initiative, unless it be that they are looking to the Federal government to furnish all of the needed protection to their inhabitants, or that the veterinary profession has failed to realize its opportunity to assist in the protection not only of the public health but also the livestock industry through the information made available by an ante-mortem and a post-mortem inspection of the animals slaughtered. It seems that the veterinary profession has considered it the duty of Boards of Health to take the initiative in meat inspection matters on the ground that meat inspection is primarily a public health measure.

Examples of State Meat Inspection

The legislatures of several states have passed laws varying in scope, providing for state meat inspection. The Pennsylvania legislature was the first to provide for state wide meat inspection through the Act of Assembly approved May 21, 1907. Early action in that state was prompted by Dr. Leonard Pearson, the progressive state veterinarian of Pennsylvania at that time. He also occupied the chair of Theory and Practice at the University of Pennsylvania School of Veterinary Medicine.

The first California meat inspection law was approved June 3, 1921. This law was amended, effective May 8, 1931, and today California's meat inspection service is outstanding for its scope and efficiency. In all instances state and municipal meat inspection laws and regulations are modeled upon the Federal law and regulations. Not long since the California officials requested and received the services of a Federal authority on meat inspection to check the state inspection with the view of ascertaining if the California slaughtering and meat packing plants and the system of state inspection equalled the standard of the Federal service. It is the intention of the California authorities that their state meat inspection service shall compare favorably with the Federal service.

In this connection there has been some agitation in certain quarters with the view of procuring for the products of establishments operating under state or municipal inspection the same privileges in interstate trade and exchange between establishments that under existing law is accorded only to the products of establishments operating under Federal inspection. It is not unlikely that if there should be a development and perfection of state and municipal meat inspection systems, approximating the Federal standard, the exchange and interstate movement of such products may be accomplished at some future time, but there is no prospect of such a change in the near future.

Meat Inspection Aids in Animal Disease Control

Meat inspection is primarily a public health measure, but our system of inspection has been developed to a point where its benefits are extended to the livestock industry.

The chief purpose of the existence of the veterinary profession is the protection of our great livestock industry against losses from preventable diseases and conditions which either kill animals or impair their value.

Various channels of approach to the objective of the veterinary profession are known,—most of these channels are occupied but others have been explored but not utilized to their full extent. Meat inspection is one of the latter. It is

primarily a veterinary channel of approach. The veterinarian has through education and experience acquired pertinent information and is in the most favorable position to inform livestock owners and others not only of the dangers from consuming meat derived from diseased animals, but also what measures should be employed to eliminate as far as possible injurious diseases which affect food animals. All measures instituted, for the control or eradication of animal diseases are based on information as to the location, prevalence, and nature of the disease in question. The ante- and post-mortem findings or in other words a reliable meat inspection system reaches not only the effects of disease on the flesh, but the records serve as a directory to the identity, geographic location, and virulence of prevalent maladies. This information forms the groundwork for evolving and developing suitable control and eradication measures, which is an important veterinary service to livestock producers.

Value of Disease Statistics

There is no one factor that has contributed more effectually than the statistics of the Federal meat inspection service, to the launching and prosecution of the cooperative tuberculosis eradication work which is being carried on so successfully by the various states and the National Government.

A further contribution of meat inspection to tuberculosis eradication is that it provides facilities for the economic salvaging of reacting animals and makes possible the marketing of the meat of affected animals, fit for food, through the regular channels of trade without arousing public prejudice. This display of public confidence is a high tribute to efficient meat inspection.

There are great possibilities in the utilization of meat-inspection statistics for the further benefit of the livestock industry. Much additional information is needed on the big subject of the distribution and prevalence of parasites in the

Abattoirs operating with Federal Inspection must carry out all processes in a cleanly manner under sanitary conditions

Southern states. A system of state meat inspection provides the facilities for obtaining much information of value to livestock producers. It has been suggested that statisticians be put to work on the records of the Federal meat-inspection service to compile more detailed information than is now being published. No doubt considerable good could be accomplished, but any work the Bureau of Animal Industry might do along this line would cover only two-thirds of the subject. Information concerning the most important remaining third, which is outside the jurisdiction of the national government, would not be available, as but a comparatively small proportion of the animals slaughtered outside of official establishments are subjected to efficient ante- and post-mortem examinations.

Universal Meat Inspection Would Improve Trade

A state meat inspection system which comprises supervision of municipal inspection would be an ideal supplement to Federal inspection from the human health standpoint. This is desirable also in order to place on an equal footing all persons and firms in a state who engage in the slaughter of animals for food and the preparation of meat-food products, such as lard, sausage, etc. Under present conditions there is nothing to prevent unscrupulous individuals and firms, operating without inspection, from mixing 30 to 50% of tallow in their lard and selling the mixture as pure lard. They might mix 20 to 30% of cereal in their sausage meat, an equal amount of water, disguise the quality of the mixture by artificial coloring matter, and sell this inferior product in competition with the sausage manufactured by establishments operating under Federal inspection. Establishments operating under Federal inspection are required to state the facts on labels attached to the product, if any cereal and if more than 3% of water is added to pork sausage, for example. We have tested samples of sausage bought on the open market which were found to contain as high as 35% of added water.

In preparing the great variety of meat food products, there are many opportunities presented for establishments operating without inspection to take advantage of the present situation to cheapen production, and reduce nutritive value of their products without a proportionate reduction in price. This is unfair to both consumers and establishments operating under government inspection. The offenders cannot be reached by Federal inspection so long as they confine their operations to state business. As many of these plants are located outside of city limits, the most effectual way to reach them is through state inspection, and this seems to be the only possible way to place their operations under supervision.

Prospects for Extension of State Inspection

Our increasing human population, the gradual concentration of our animal population, together with the changes that are being wrought in animal production, the relation of the present health status of our food animals to the public health, and the trend of thought and action toward better sanitation in the preparation and distribution of food supplies, all indicate a growing need for the states and municipalities to supplement our present national meat-inspection system. Further, none of our industries is of greater benefit and importance to the nation than is livestock production and the conversion of livestock products into food, clothing, and other materials essential to our existence and comfort. This great industry should receive all encouragement and assistance possible. A properly coordinated system of state and municipal meat inspection in each state, operated preferably under state law, would supplement our Federal meat inspection and, in addition to protecting the public health and preventing unfair and unjust practices, it could be utilized to the advantage of the livestock producers in the various states.

Swine Disease Control*

By J. B. Hollenbeck, Columbus, Ohio

IN DISCUSSING the control of diseases of swine, it becomes necessary to class them in two groups; those resulting from the presence of pathogenic bacteria, and diseases or conditions resulting from improper management, feeding and breeding.

Contagious and infectious diseases are caused by specific organisms or viruses, peculiar to that particular disease, and as these causative agents are so widely scattered over different parts of the country and are differently affected by heat, cold, moisture and disinfecting agents, it is difficult to outline a definite program for their control. On the other hand, improper management, feeding, breeding or housing may be a predisposing factor of a disease or condition causing more destruction than the presence of some of the contagious or infectious diseases.

Before making a diagnosis several things have to be taken into consideration, including the history, age, feed, conditions of pens, feed lots and water supply and the sanitary conditions in general. Also the diagnostician must make a complete survey of the subjective symptoms presented, that is the temperature, respiration, body discharges, the desire for food and water, and the general appearance and activity of the animal, before an autopsy is held. The postmortem examination should be most thorough-going and must include sufficient number of animals to determine definitely the primary cause of disease, and if complications are present the secondary invaders may be taken into consideration when treatment is advised. The more data one has at his disposal the easier it is to arrive at a definite and accurate diagnosis.

*Presented at meetings of the Wisconsin, Minnesota and North Dakota Veterinary Medical Associations, July, 1932.

Hog Cholera

The successful prevention of hog cholera was first demonstrated by the Bureau of Animal Industry of the United States Department of Agriculture and the results published for the benefit of the swine industry in 1908. Later it became advisable for the Bureau of Animal Industry to supervise the manufacture of anti-hog cholera serum and virus, leaving the control of its sale and administration to state authorities. Seemingly, the majority of the states pay little or no attention to control of the distribution and use of serum and virus within their borders. This results in severe losses to hog owners from the promiscuous use of virus in the hands of unskilled diagnosticians and operators and has created in the minds of many farmers the belief that each knows the proper place to inject and the proper amount of serum and virus to use for pigs of all ages and weights and variations in condition. This controversy, as a result, is still raging among the hog owners and veterinarians as it did fifteen years ago. It is quite singular that the administration of no other biologic or drug has ever given rise to such extended discussion, as to the dosage and site selected for the administration as has serum and virus.

When uncomplicated hog cholera is diagnosed, bear in mind that serum should be administered in large enough doses to prevent any further development of the disease that may be evident or in the incubation period, and to counteract the virus about to be injected. No less than 30cc of serum should be given regardless of the age and size of the pig and then graduate the dosage according to the weight of the animal and never use less than 2cc of virus. As virus loses a part of its virulence as it ages, would

it not be advisable to increase the dosage to 3cc at the beginning of thirty days from expiration? In any case, remember that it is the virus that produces the immunity, therefore administer plenty of it.

It is my opinion that healthy hogs properly treated with serum and virus and correctly fed and cared for following treatment will never become sick with hog cholera. Many so-called virus or serum "breaks" are the result of improper feeding. A sudden change of feed or a forced feeding of worm powders and mineral mixtures may produce a condition that is difficult to differentiate from a like condition produced by hog cholera virus, or, in fact by many other disease producing organisms. It is as necessary then that the hog be protected from improper feed as from virus.

The destruction of the endothelium of the blood vessels in the diseased subjects produces blood clots in the capillaries. This condition in the intestinal wall allows the entrance of pathogenic bacteria which are normally present in the alimentary tract. These secondary invaders may produce complications which obscure the primary infection and the result is a diagnosis of "mixed infection" which in reality is secondary. The organisms causing hemorrhagic septicemia, necrotic enteritis and pig typhoid may be present in the intestine of apparently normal hogs at all times and still they do not produce these diseases until, in some way, they enter the tissues. It follows then, or at least the indications are, that these diseases are never primary and that there must be a predisposing cause for the infection. Let me emphasize, therefore, that it is the direct cause which must be guarded against.

Dr. Robert Jay says, "We vaccinate against hog cholera to protect against the virus, not against these secondary invaders, for the reason that without a primary cause, secondary invasions would not occur."

Improper feeding and insanitary sursoundings also often produces a condition by which secondary invaders might enter the tissues and obscure the primary cause of the trouble. A vaccinated hog is not immune to cholera when it is not immune to the feed it eats. A break in the continuity of immunity of hogs vaccinated against cholera, as I have outlined above, reveals to me faulty feeding.

The control of hog cholera, one of the most virulent diseases of domestic animals and causing an annual loss greater than the combined loss from all other diseases of swine, receives little or no attention from some state authorities. The shipping of hog cholera virus to unskilled vaccinators, the supervision of community sales, the quarantine of infected herds and the disposal of dead animals should receive more and closer supervision. During the outbreak of 1931 so many cases were traced directly to these community sales that they became commonly known among sanitary workers and breeders as "calamity sales."

Swine Erysipelas

While this disease has been recognized in the United States for a number of years in the form of diamond skin disease, the more virulent form has come in for wide attention only during the last few years. It has been shown to exist in South Dakota, Nebraska, Iowa, Missouri and Ohio within the last two years, and no doubt has been one of the complications of hog cholera and post vaccination troubles for some time.

Swine erysipelas occurs in several forms and in different degrees of severity in each outbreak. The lesions of the mild or subacute form—diamond skin disease—may become severe, causing extensive dermatitis and sloughing of skin, ears, tail and occasionally one or more feet. General arthritis is frequent, causing lameness and incoordination of limb movements.

The antemortem symptoms many times resemble hog cholera or what has

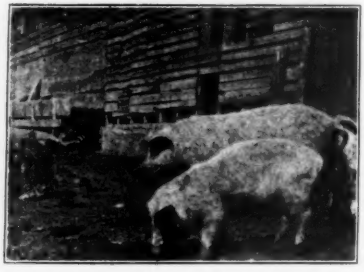
been generally diagnosed as such. The temperature ranges from 104° F. to 108° F.; the gait is wabbly; there is gauntness, retching and vomiting. In the severe form, diarrhea occurs; the feces are often tinged with blood and occasionally bloody urine will be passed. Oftentimes the afflicted hogs, when suddenly aroused, will jump up and run fifty to one hundred feet, fall down and have convulsions, then in a few minutes get up and walk away apparently normal. Again, others carrying a high temperature will eat a normal amount of grain, while still others in the same herd will have a depraved appetite and eat all the filth, rotten straw and manure they can find and even drink barnyard water.

Let me again emphasize the importance of a postmortem examination in a diagnosis. Should the owner refuse to allow an autopsy to be held on one or more sick animals, diagnosis and treatment should be declined. If the entire herd is not worth sacrificing one or more sick pigs for the purpose of arriving at a correct diagnosis, it is much better that you turn the case over to one who makes diagnoses without asking questions or holding postmortem examinations. Autopsies, on the other hand, often prove of little value and may lower your standing as a diagnostician in the mind of the owner. A careful antemortem inspection and a thorough postmortem examination of one sick hog, showing well marked symptoms of disease is of far greater value than an autopsy on several that have been dead from one to twenty-four hours. Be sure that your postmortem examination is thorough. Strange as it may seem, I have witnessed postmortems where the body lymph nodes, kidneys, bladder and larynx were not examined and the heart was not opened. Hence, it may be well to outline a postmortem technique and the most characteristic findings which, in cases of swine erysipelas, are as varied as the antemortem symptoms.

Note the color of the blood, as internal hemorrhages may have caused it to be very light in color. Note the color and condition of the skin on the belly, as there may be small or large hemorrhages present. Examine the submaxillary, cervical, pre-scapular, pre-sternal, inguinal and mammary lymph nodes. These glands may be enlarged and full of serum and often they are filled with dark-colored blood. Remove the intestines and examine them for hemorrhages. Unless there has been bloody diarrhea you will find that these hemorrhages are confined to the muscular coat. The bladder wall may present a number of hemorrhagic spots and in severe cases the wall may be a quarter of an inch thick and bright red in color on the outside, with clots of blood within. The kidneys may or may not be hemorrhagic. Occasionally hemorrhagic areas are found in the skeletal muscles, fatty tissue, under the peritoneum and pleura, in the heart muscle and pericardial sac. In chronic cases there is often a well marked cauliflower-like growth on the aortic valve of the left ventricle. It is well to remove the eyelids that you may examine the sclerotic coat for the presence of small hemorrhages.

The paint brush appearance on the stomach wall is found less often than one would expect, from the many reports of this condition in the journals during the past year, but when found it is of considerable diagnostic importance.

While swine erysipelas has been diagnosed in several states, great care should



Stunted pigs reared in filthy surroundings and suffering from Ascaris Infestation

be taken that other diseases, especially hog cholera, be not mistaken for erysipelas. When there is any doubt regarding a positive diagnosis, specimens should be forwarded to a laboratory for confirmation. In preparing specimens for shipment, be sure that they are well packed in ice, as it is sometimes necessary to freeze them for a week or more to eliminate other bacteria from the field, in order to secure a pure culture of *B. erysipelatis suis.*

Internal Parasites

Internal parasites are a menace to the hog raising industry and are best controlled by proper sanitation of hog houses, pens and yards and the growing pigs on clean pastures. Direct light is known to be of great value in the extermination of this and other types of disease producing organisms. Here are a few facts that may be of help in carrying out preventive measures:

1. The common round worm, *Ascaris lumbricoides,* has no intermediate host.

2. The thorn head, *Macracanthorhynchus hirudinaceus,* passes one stage of its life cycle in the body of the June bug larva or grub worm.

3. Lung worm, *Matastrongylus elongatus,* has no intermediate hosts. The most favorable conditions for growth of the larvae, according to Hall, occur in damp, porous soil containing much organic matter. However, recent reports indicate that the larval form of this parasite passes a part of its life in the body of the common angle worm. Infection may be lessened to some extent by ringing the hogs before turning them into pasture.

Infectious Bronchitis

Hog "flu" occurs principally during the winter months in all localities where hogs are raised in large numbers. A large percentage of the herd are attacked simultaneously and generally the more thrifty ones are first affected. The temperatures run high, and are accompanied by severe coughing. With the history and symptoms available one can diagnose "flu" easily. In this case a postmortem examination is seldom necessary.

A well bedded pen, free from draughts, plenty of clean water, provided in a clean trough and no feed for forty-eight hours makes a most wonderful improvement in a herd suffering from influenza.

Posterior Paralysis

Posterior paralysis occurs in different localities at different times and appears to be more common some years than others. It is due to a deficiency of calcium salts in the system. As this condition is well known and readily diagnosed, a description seems unnecessary. The treatment, however, has not always been satisfactory. In a number of cases the introduction of 40 cc of calcium chloride intravenously has given excellent results, especially when the procedure outlined below is followed. Before treatment, however, examine for fracture of the femur.

After the sow has been securely tied, the ear is washed and a small hypodermic needle inserted in an auricular vein. I might say at this point, that the ear vein should be employed for this injection in all animals. An 80 cc-syringe, one-half full of calcium chloride is adjusted to the needle. The syringe is then filled with blood drawn from the vein and after the calcium chloride and the blood are mixed in the syringe, inject the mixture *slowly* into the blood stream. The mixing of the calcium chloride and the blood in the syringe before injecting it into the animal tends to prevent sloughing and lessens shock to a marked degree. In fact, I am of the opinion that all intravenous medication will be best tolerated by the patient if the medicament be diluted with the animal's own blood before injection.

Necrotic Enteritis

Necrotic enteritis is usually found infecting pigs from three weeks to four months of age and being most often associated with insanitary surroundings is appropriately designated as a filth-borne dis-

ease. This condition is so common in pigs that it is not necessary to describe in detail here, the symptoms and postmortem lesions. The temperature seldom goes above 105° F. A rapid loss of weight, followed by diarrhea, is the most pronounced symptom. On postmortem examination one finds that the mucous membrane of the large intestine is most often infected. However, ulcers may also be found in the small intestines. Small yellow specks are first formed. Later these coalesce and ultimately destroy the mucous membrane of the bowel. The greenish-yellow mass then covers the infected area. Later this becomes a scab, which may detach in long patches, leaving a raw, tender surface.

Whole oats soaked in lye water have been recommended for treatment of this condition for some time and many articles have appeared describing the successful results obtained by this method of treatment until the majority of practicing veterinarians prescribe it without question. The object of this procedure is, presumably, to render the contents of the intestines more alkaline in reaction, thus producing an unsuitable medium for the growth *B. suipestifer, B. necrophorus* and others, causing this condition. However, these same bacteria render alkaline the culture media (milk or potatoes) in which they are grown artificially. Also, during the past three months I have held twenty-four postmortem examinations in fourteen herds of swine suffering from necrotic enteritis and have found the contents of the infected bowel strongly alkaline in reaction before any treatment had been administered.

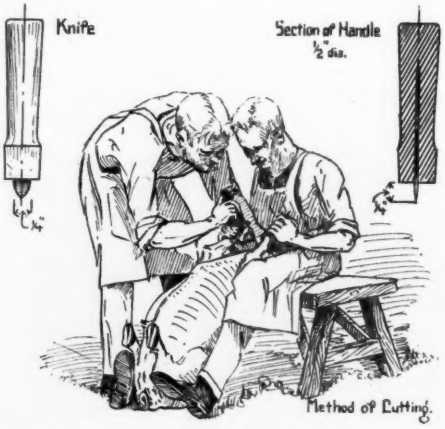
Many times I have found oat hulls buried deep in the mucous coat and often even through to the muscular layer of the infected part. This was in hogs which had been fed for several days on whole oats soaked in lye water. With the evidence at hand I have been forced to believe that this treatment serves to aggravate the situation already present and is not the best. If the infected pigs are fed a small amount of wheat bran, with one pint of saturated solution of copper sulphate in ten gallons of sour milk or buttermilk, recovery will take place much faster. I believe that it is also imperative to place the hogs in clean quarters and that they be given a clean bed and floors.

Infectious Enteritis

In contradistinction to necrotic enteritis this condition may spread through practically the entire herd before the owner realizes the severity of the malady.

The immediate symptoms are a sudden rise in temperature, marked dejection and tucked up flanks. These are followed, usually, by diarrhea, which is oftentimes bloody.

Should a large percentage of the herd become sick at once, it is very likely that the primary cause was a sudden change of feed or an overfeeding before the pigs became accustomed to the feed which they were eating. One or more of the hogs should be killed and an autopsy held to determine the true condition and the possible complications which may have developed. Should there be hemorrhages in the stomach and bowel walls, bladder and kidneys, swine erysipelas may be suspected and the condition should be treated accordingly.



The Kinsley operation for the prevention of rooting

Uncomplicated enteritis responds to treatment in a few days if the sick animals are removed to clean and disinfected quarters. All grain should be withheld for forty-eight hours. One pint of saturated solution of copper sulphate in twenty gallons of milk should be fed, and should be fed from a clean trough. The cleaner the pens and the feed troughs are kept, the sooner recovery will take place. As improvement becomes evident, alfalfa hay and a small amount of ground feed may be given. Enteritis bacterins have also proved helpful in some of these cases.

Feeding Troubles

Actual contamination of food with bacteria of the paratyphoid type is much more common than poisoning by toxins that have been generated in the food long before it is eaten. This proves that clean feeding floors and drinking troughs are a great benefit to the health of all animals.

As I have pointed out, these conditions are many times predisposing factors to infectious or necrotic enteritis. Under such circumstances, of course, the feed should be withheld and treatment for enteritis administered, as has been outlined above.

A sudden change of feed or forced feeding of worm powders or hog mineral, after vaccination, very often produces a break in the immunity of serum and virus.

In bringing shotes to full feed it is better to feed legumes or the trinity mixture in the morning and carbohydrates, such as middlings and barley, in the afternoon. The grain rations may be gradually increased until the animals are on full feed of from five to six pounds of ground grain per one hundredweight per day. If the shotes are running in alfalfa or sweet clover pasture, grain may be fed for the evening meal in gradually increasing amounts, until they are on full feed.

Sore Ears in Pigs

Practitioners are often called to treat suckling pigs suffering from sore ears and swollen faces. These infected wounds are supposedly caused from pigs fighting. For the most part, however, this condition is due to sharp toe nails and can be prevented by filing smooth the nails of the hind feet.

Tuberculosis

When tuberculosis is diagnosed in swine, it should be remembered that the majority of these cases are due to the avian strain, since many of the tubercular cattle have been removed from the farms. If the owner desires a tuberculosis-free herd of brood sows, it becomes necessary to test all the breeding hogs with both avian and bovine tuberculin.

In testing brood sows, the ears seem to be the most desirable place to make the injection. However, the ears are very often covered with scabs, scars or small tumors and a certain amount of care is necessary to locate a smooth place to insert the needle. The tip of the ear should be taken in the left hand, folded under and rolled tightly by clenching the fist. This gives one a firm hold and the sow seldom makes a move when the injection is made. Mercurochrome should then be applied to the point of injection. This will assist later in locating the exact point at which the swelling should occur on a reactor. Avian tuberculin should be injected in one ear and bovine tuberculin in the other. The vulva may be used in place of one ear, however. Readings are made forty-eight hours after injection.

Clinical Diagnosis in Bovines*

By EDWARD R. CUSHING, Plainfield, New Jersey

THE subject of clinical diagnosis in bovines is one of such breadth that in this short time it will be possible to touch upon only a few of the most important features of it. According to Malkmus, "Diagnosis is the art of determining internal changes of the body by the aid of externally visible or otherwise appreciable changes in the animal's condition or some of its organs. It also includes the recognition and name of the disease."

Since disease is some deviation from the normal condition it is absolutely essential that one be entirely familiar with the normal conditions. Without this knowledge, one will be unable to recognize the symptoms shown by the animal presented for examination. The importance of symptoms depends very largely upon the conditions under which they appear, and, upon one's ability to mentally correlate the true symptoms, depends his success or failure as a diagnostician.

There are a number of things upon which a diagnosis is dependent—First of all the anamnesis or previous history of the case. Inasmuch as one is unable to directly communicate with the patient, it is essential that as much information as possible be obtained from the care-taker; the conditions under which the patient first showed abnormal symptoms, the number affected, how long the condition has existed, just how the patient has acted and if possible to get the information from the owner, what steps have already been taken to alleviate the abnormality.

Too frequently though, this latter information is hard to obtain, at least the real truth of the situation. Any veterinarian who has had much cattle practice has encountered cases where the patient is breathing very rapidly and labored, temperature and pulse high with distinct râles over one or both lungs. The owner is rather evasive in his answers to your questions but is emphatic in his denial of having previously given any medication to the animal. Inasmuch as primary penumonia is rare in cattle you know very well that the patient has a mechanical pneumonia from having been improperly but thoroughly drenched by the attendant although you can not diplomatically accuse him of a mis-statement.

Again the history of the case is very valuable in diagnosing some infectious diseases; among others is hemorrhagic septicemia. We invariably find a history of some recent shipment or movement of cattle into the affected herd.

Another very important thing to be taken into consideration is the season of the year. This is especially important in dealing with digestive disorders in cattle, as well as certain infectious diseases. Primary or simple indigestion is rare among cattle on pasture unless on very dry or "burned up" pastures or within the first week or two after being turned on to pasture in the spring.

After obtaining from the owner or endeavoring to obtain from him something regarding the history of the case, it is essential to determine by our own senses as much information as we can. First of all by *inspection*. One should not be too hasty in laying hands on the patient before making careful observations with the unaided eye. Frequently a true diagnosis can be made without further examination. This is true in most cases of parturient paresis or in local affections such as actinomycosis or lump jaw, tumorous growths, some accident cases, etc. Second by *palpation*. By palpitation we gain information as to the consistency, local temperature, sensitiveness of a part, etc. Also by rectal palpation much information can be obtained as to the condition of the posterior abdominal viscera.

*Read before the 48th Semi-annual Meeting of the Veterinary Medical Association of New Jersey, Atlantic City, July 15-16, 1932.

Third by *percussion.* This may be done by a percussion hammer and pleximeter or with the fingers, over areas where vibration or sound may be emitted. Percussion is also very helpful in bringing out pain or sensitiveness over certain areas. Percussion over the liver, along the posterior border of the last rib on the right side, will often bring evidence of pain in traumatic gastritis. Fourth. Much valuable information can be secured by *auscultation* in making a diagnosis. This means is very essential in examination of the heart, lungs, and digestive apparatus. In most cases of indigestion an atony of the rumen is readily diagnosed by a cessation of its normal two contractions per minute.

Having obtained from the attendant and the patient itself, the desired information which also includes age, temperature, pulse, respiration, color of mucous membranes, etc., one must mentally correlate this information in order to arrive at a diagnosis. I will mention some of the symptoms found in a few of the digestive diseases of cattle and their value in differential diagnosis.

In traumatic gastritis and peritonitis there is a wide variation of symptoms. This condition may occur at any season of the year while as previously stated, cases of simple indigestion are almost unknown in cattle during the season that they are on pasture. Traumatic gastritis is frequently seen during advanced pregnancy or within a comparatively short time after parturition. This is an important fact to consider in the diagnosis although the lack of a history of recent parturition does not eliminate the possibility of this condition. The patient generally shows sudden loss of appetite and milk flow, and often a stiffness of gait. The temperature usually is about normal but if an abscess is in the process of formation at the point of trauma, a high temperature may be present or a high temperature in the afternoon and a normal temperature in the morning. The pulse usually is accelerated with or without a corresponding rise of temperature. Frequently, as previously stated, there is evidence of pain on percussion in the region of the reticulum or along the border of the last rib on the right side which is immediately lateral to the posterior border of the liver. It has been my experience that ofttimes cattle which show repeated attacks of mastitis will eventually show evidence of traumatic gastritis, and when autopsied will verify the symptoms shown. If a case of so-called indigestion fails to respond within a few days to the indicated treatment, this fact alone is sufficient to make one suspect traumatic gastritis.

Another condition which shows symptoms very similar to traumatic gastritis and may often be confused with it, is necrophorus infection of the liver. In this condition the patient shows loss of appetite, stiffness of gait, weakness, emaciation, and pain on percussion over the liver. The pulse is accelerated and in every case that I have seen, the temperature has remained above 104° F. Here again the history plays an important part in the diagnosis. Animals with this condition most generally are in a herd where

Traumatic Pericarditis

necrophorus infection in the feet or "foul hoof" is prevalent or else the animals have been on low pasture several months previous to the visible symptoms of the disease. It is more prevalent following a season of weather extremes—that is, a very wet summer or a very dry one. The organism is ingested through the medium of muddy water. In wet seasons, pastures are muddy and water stands all over the ground and in dry seasons the cattle congregate in any mud hole or pool of water to which they can gain access.

Most practitioners are familiar with symptoms of the simple digestive disorders of cattle but when they are accompanied by some unusual symptom, that may put a slightly different aspect on the whole picture. For instance, if the digestive disturbance is accompanied by vomiting it may mean either an impaction of the omasum, an occlusion of the openings between the compartments of the stomach, or a peritonitis. Vomiting may however occasionally occur in cattle which have been a long time off pasture, without any other apparent digestive disturbance.

Colicy pains in cattle are not a common symptom in digestive disturbances. In two instances that I recall where they have been present early in the course of the disease together with a complete or partial cessation of bowel action, an intussusception has been present in the small intestines. This condition can sometimes be palpated by rectal palpation. I have observed colicy symptoms in one case where areas of necrosis involving the wall of the reticulum had caused perforations of the wall permitting the stomach contents to escape into the abdominal cavity. Colicy symptoms sometimes follow manipulations and treatment of the female genital tract.

Chronic bloating in cattle leads one to suspect at least a tubercular mediastinal lymph node although this condition may exist in traumatic gastritis.

Diarrhea in cattle is another symptom which may be caused by a number of conditions some of which are acute bowel catarrh, so-called "winter dysentery" which Doctors Jones and Little have found to be highly infectious and due to a vibrio; Johne's disease, which causes a periodically appearing but persistent diarrhea, and coccidiosis which appears chiefly in young cattle and manifests itself with a bloody diarrhea accompanied by a thickened and highly inflamed mucous lining of the rectum and much straining.

When several animals are affected in the same manner and at the same time one should suspect that he is dealing with a common cause. Of course he must always ascertain whether or not it is of an infectious nature, whether due to feed, or due to some other cause to which they have all been exposed. In closing I want to relate an instance that came under my observation several years ago. The disease condition involved a herd of some twenty-five cattle.

There had been several light frosts in September so that the upper leaves of the corn had been browned. The corn on a five-acre lot near the barn had all been cut and put in the silo but as there was some corn which had fallen off the loads or had been trampled down, quite a lot of fodder still remained on the ground available for feed. About ten o'clock the caretaker turned the herd of cattle on to this cut-over lot and left them there until late that afternoon. That night none of the cattle cared much for their grain and the milk production, was considerably less than usual although the attendant did not give this much thought as the milking was done earlier than was customary. The next morning none of the cattle ate their feed and two or three were bloated and unable to rise. By ten o'clock one was dead and several more were bloated, groaning, and unable to get on their feet. By three o'clock in the afternoon three more had died and most of the cattle were bloated, groaning, and in a semi-comatose condition. At that time the attending veterinarian notified the state authorities fearing some virulent infectious disease, and asked for aid. An-

other veterinarian was dispatched to the scene, arriving about 6:00 P. M. At this time seven were dead and only one animal in the stable was able to rise. The saline purgatives previously given had had little effect. A trocar was used on each cow and by means of a pump was given two pailsful of a solution consisting of a stimulant, anti-ferment and an additional saline purge. This was mixed well with rumen contents by means of a long stirring rod inserted through the canula. Some of the cattle were helped by this treatment but by noon the following day 18 of the animals were dead and the remainder of the herd still quite sick although some were on the road to recovery. Autopsies and laboratory examinations showed no evidence of an infectious nature and chemical analysis of the content of the rumens showed no trace of metallic poison. The rumens of all autopsied cattle were greatly distended with fresh stalks and ears of corn. This was apparently a "wholesale" case of acute indigestion with tympany although with the number involved it gave every appearance of a virulent infection or violent poison.

MORPHINE FOR STRYCHNINE POISONING IN DOGS

About nine years ago, I first tried the effect of a large dose of morphine as an antidote to strychnine poisoning in dogs. In this instance a bull terrier found *in extremis* was injected subcutaneously with a solution of four grains of morphine sulphate. Twenty-four hours later, the dog had recovered completely.

Since then a large number of cases of both malicious and accidental poisoning of dogs by strychnine have been treated in this manner by me, the dose varying from 1½ grains in the case of a two-month-old fox terrier pup to 5 grains for a large Alsatian, and in not a single instance has the drug failed to bring about recovery.—S. Van Rensburg, in *The Journal of the South African Veterinary Medical Association.*

TREATMENT FOR FRACTURES OF THE MANDIBLE IN DOGS

After reading the article on fractures of the Inferior Maxilla in Doctor Brumley's latest book on Diseases of Small Domesticated Animals, in which the author states that the prognosis is unfavorable due to difficulty in limiting movements of the fractured bone, I want to offer to the practitioners a treatment that I have used for some time in fractures through the symphysis. It is simple and effective.

I hesitate to mention this since doubtless many veterinarians have already resorted to this means of immobilizing the parts, but Doctor Brumley's article causes me to offer my bit in the hope that it will aid those small animal practitioners who have been having trouble with this particular fracture.

Use a fairly large needle (depending on the size of the animal) threaded with heavy braided silk suture or silver wire, insert the needle down through the tissues of the mouth close to the bone, just external to the inferior maxillary bone, immediately in back of the symphysis, bringing the needle out through the skin in the center of the jaw. Rethread the needle with the upper portion of the thread, cross the mouth, insert the needle in a like manner on the opposite side, bringing the suture down through the same opening in the skin made by the first puncture, draw the suture as tight as possible and tie.

If silver wire is used, make a twist and tighten with the aid of forceps. The fracture should heal nicely in from ten days to three weeks, depending on the age of the animal. Remove the suture when healing is complete. The resulting wound heals quickly.

Further information will be furnished upon request.

I would like to have reports from those using this method, regardless of results.

H. L. Blackburn.

Ft. Worth, Tex.

THE USE OF AZAMINE IN MASTITIS

February 6, 1932, a grade Guernsey cow, four years old, freshened normally and for four days the udder appeared normal, then the left front quarter suddenly developed acute mastitis. The quarter was very much enlarged, and indurated, the secretion being only a few strips of flaky, straw colored liquid. One pint of the 0.5% Azamine aqueous suspension in boiled distilled water was injected into the quarter and allowed to remain for 12 hours. Improvement was shown the following day, and a similar injection was made and left 12 hours. In four days' time the milk which the infected quarter secreted was quite normal. She was given stock bacterin daily for three days. She did not give a normal amount of milk from this quarter for some little time after recovery from the acute condition, but the volume is back now nearly to normal and I believe it will be normal after the next freshening. Usually cases of the severity of this one do not respond to other lines of treatment that I have used.

February 12, 1932, a famous show cow developed mastitis, in the right forequarter, four days after freshening. She is one of the most valuable cows of the Guernsey breed, having been second at the National Dairy Show, and has won many firsts in high class company. She is also a high record producer. At the time of freshening milk fever developed and calcium gluconate only was used, with a satisfactory response. Four days later mastitis and a general septic condition developed. The temperature was 105° F., breathing was rapid and the general condition much depressed. Glucose was used intravenously, stimulants and cathartics were given and a bacterin which consisted of one part chloroform and nine parts of the affected milk was injected; 10cc first day, and 20cc daily thereafter for seven days. Azamine in 0.5% aqueous suspension was injected; one pint in the affected quarter the first day that mastitis developed. Improvement was shown on the following day, both in the general physical condition and in the affected quarter. Another pint was injected, but the affected quarter appeared to be worse on the third day, and gave off a very foul secretion. Another pint of the Azamine 0.5% aqueous suspension was injected and allowed to remain six hours. The discharge from this quarter, six hours later, when milked had a very bad odor. Injections of a pint of this Azamine 0.5% aqueous suspension were made daily for nearly a week, leaving it in the udder in each case for 6 to 10 hours. Improvement was shown in this quarter from the third day on, and a week after the first injection, milk was being obtained in about 1½ quarts daily. This recovery continued steadily until now this cow is giving nearly her normal amount of milk from this quarter. The cow had excellent care, every hour of the day and night during the week, with a hot witch-hazel massage of the udder every two hours. I believe the udder was saved because of the injection of the Azamine aqueous suspension.

On March 16, I visited a grade herd of Guernseys, in which there were five mastitis cases. Four were affected in one quarter only, and they had never previously been troubled, the fifth cow, an aged one, was affected in three quarters, the milk being slimy. She had been troubled for several months; the herdsman despaired of her. However, the woman who owns the herd would not consent to dispose of her. I am sure she was the source of the infection in the other cows. She has been a sixty-pound milker and the owner considered her of considerable value. The autogenous bacterin which we make with chloroform was used on each individual, 10cc the first day and 20cc the second, and then this treatment was stopped on all cows except the one affected in three quarters, she receiving 30cc for a third injection. One pint of

the Azamine in 0.5% aqueous suspension was injected in each of the affected quarters and allowed to remain twelve hours. The next morning the owner phoned me that the cow was apparently normal, and he wanted to send her milk to the creamery, which of course I refused. Udder injections were continued as I have outlined, on these affected quarters for three days, with complete recovery in about a week, and with a return to almost normal volume of milk. The milk from these cases cleared up and after passing the thybromol test, was sent to the creamery in about a week. The normal volume of milk from the affected quarters was attained in about 10 days. This aged cow had had several bacterin treatments previously, for she had been affected several months, with no apparent recovery. I am sure that the udder injection was responsible for the quick improvement.

This Azamine aqueous suspension was injected into the affected quarter, through the teat canal, by means of pressure, using the 250cc Shikles intravenous injection apparatus, and is easily done. I used boiled distilled water, and noticed that the dye was completely absorbed with no systemic reactions.

I am delighted with the results shown in the treatment of mastitis, with Azamine, and shall continue to use it on both acute and chronic cases of mastitis.

Conclusions

I am convinced that Azamine used as stated above relieved acute mastitis.

The action of Azamine was prompt, with no apparent irritation, or systemic effect.

The causative organisms in the udder were destroyed, as evidenced by a negative thybromol on the milk from these quarters. I believe this was due to the action of Azamine in the udder.

L. L. Parker.

Catskill, N. Y.

VETERINARIANS—PUBLIC HEALTH BENEFACTORS

Pasteurization is an effective way to prevent milk from carrying tuberculosis, but pasteurization is confined largely to city milk supplies. Furthermore, there are about 10,000 dealers in Illinois who handle raw or unpasteurized milk. During the last two years these dealers have cut prices and in that way have increased the volume of their trade. The integrity, skill and industry of veterinarians, who are responsible for testing cattle, is the only safeguard which stands between the consumers of this raw milk and the possibility of tuberculosis.—Andy Hall, M.D., Director, Ill. Dept. of Health.

HAZARDS OF SURGERY IN CATTLE FEEDING ON SWEET CLOVER HAY

Even minor surgical operations may result in serious if not fatal hemorrhage in cattle that have been fed for any considerable length of time on sweet clover hay. When called upon to castrate calves or dehorn cattle or perform other surgical operations on these animals, veterinarians should ascertain if they have been fed sweet clover hay and, if so, should proceed with caution. A small quantity of blood may be drawn into a test tube. If it requires more than 20 minutes to coagulate, surgical procedure should, if possible, be deferred for a month and in the meantime no sweet clover hay should be fed. If the operation is one that must be performed immediately, the operator should take the precaution of having at hand a source of blood from animals that have not been fed sweet clover hay. Where a considerable number of animals are to be operated upon, a nearby packing house forms a convenient source of blood supply. The injection of defibrinated blood from a normal animal is about the only worth while treatment for hemorrhage in animals suffering from sweet clover disease.

Ano-Vulvitis in Cattle*

By RALPH B. LITTLE, Princeton, New Jersey

I SHALL present briefly a peculiar form of vaginitis in bovines which Dr. F. S. Jones and I had an opportunity to study this spring.

Before describing this particular outbreak it would be well to mention the different forms of vaginitis already reported in this country. From 1890 to 1907 numerous outbreaks of ano-vulvitis were reported in the middle west. In some herds the disease was confined to females, whereas in other herds steers and breeding bulls were affected.

Generally the first symptom was a small ulcer on the external lips of the vulva. As the disease progressed the mucosa of the vulva and vagina became involved. In certain individuals these organs were greatly swollen, with deep fissures radiating from the primary ulcer. In time the skin between the fissures sloughed, leaving a raw, exposed, surface. Prolapse of the vagina was frequently reported and may have resulted from pressure. The infection of the rectum both in males and females was confined chiefly to the skin surrounding the anus.

In 1900 Parker recovered from the interior of such ulcers a bacillus resembling *Bacillus typhosus*. He suggested that this organism might be the causative agent. Later *B. necrophorus* was cultivated from the ulcers and fissures and this organism was regarded as the etiological agent.

In 1907 St. Raebiger published a paper on infectious vaginal catarrh in cattle. From his description I gathered he was studying infectious granular vaginitis. Raebiger reported that streptococci were always found in the vaginal secretions. On the whole his findings agreed with those of Ostertag who had previously reported that infectious catarrh was caused by strepococci.

In 1927 Jones and the speaker found in this country a granular vaginitis in cows associated with a gram negative bacillus with tiny polar granules. It is true that in practically every spontaneous case of granular vaginitis studied streptococci were encountered either on the mucosa or in the vaginal discharges, but such streptococci, when brushed on the vaginal mucosa, failed to reproduce granular vaginitis. Cultures of the Gram-negative bacilli, when introduced into the vagina, incited the typical disease. In the acute stage there is a marked swelling of the vulva and vagina. The parts are tender to manipulation. The mucosa membrane is congested. Later small ulcers appear which coalesce to form large plaques of grayish or yellowish white exudate. When the exudate is forcibly removed a raw, bleeding, grayish red surface is exposed. The inflammation slowly subsides and the exudate sloughs exposing a granulating surface. In from 7 to 18 days small red areas embedded in the mucous membrane appear. These red areas later develop into typical granules.

In the fall of 1931 a New Jersey farmer, who had a herd of 15 dairy cows, decided to replace a number of them with more profitable individuals. There was no previous history of severe losses in his herd other than the usual deaths or infections encountered in any small herd. In August, 1931, he purchased 6 cows and a 14-months-old bull from a cattle dealer. Two of the cows were lactating, the others were springers. Due to dystocia two premature calves had to be removed. The placentae were retained. The vaginal discharges were fetid. Another cow gave birth to a dead calf. The placenta was retained. In October one of the purchased cows, which had calved on the farm, developed vaginitis and died suddenly. Two other purchased cows had the same disease and died. The bull later had a severe infection of the rectum and succumbed. In January two separately

* Presented at a meeting of the Veterinary Medical Association of New Jersey, Atlantic City, July 15, 1932.

stabled heifers, which were due to freshen in February, contracted the disease and died. By April 19th a total of 3 cows, 2 heifers and a young bull had succumbed.

Symptoms

As a rule at the onset the tail was held high. In the male the first symptom was straining. In the cow a small ulcer soon appeared, either on the lips of the vulva or on the floor, sides, or dorsal portion of the vagina. Later there was a marked swelling of the vulva with congestion and infiltration of the vaginal mucosa. The mucous membrane of the vagina was soon covered with small ulcers which later coalesced to form plaques of thick, yellowish-white exudate. The cows strained considerably. When the rectum was involved there was constant straining with the passage of small amounts of feces and blood. The discharges were fetid. The mucus folds of the rectum were swollen and ulcerated. Fissures of the rectum were common.

It is not clear whether the primary lesions develop as an external ulcer, anal fissure, or some ulcerative fissure on the mucus folds of the rectum. When the infection is well established there is destruction of the anal sphincter so that the bowel movements are not controlled and the feces are passed at the side of the anus. The buttocks of both cows and bulls are smeared with feces. When both the vagina and rectum are involved the animals experience considerable discomfort. The continuous straining appears to cause a partial prolapse of the rectum and vagina.

On our first visit to the farm, April 19th, the herd consisted of nine cows and an unbred Jersey heifer about 14 months of age. This heifer was infected during the winter. On vaginal exploration a finger could be passed directly from the vagina to the rectum through an old perforation. The anal sphincter on the right side of the anus was destroyed. The skin surrounding the anus on this side, as well as the muscles and rectal tissues, was indurated. The feces, instead of being passed normally, were discharged to the right, smearing this side of the buttocks. Occasionally feces were passed through the vagina. A Holstein cow which previously had a severe attack of vaginitis showed the typical lesions of the rectum which were manifested by considerable destruction of the tissues. In this animal there was constant straining with the passage of blood and mucus with each defecation. At stool the entire anal region was ballooned outward. The odor from the discharges was very obnoxious.

The remaining eight cows were examined for disease of either the vagina or the rectum. Two cows had scar tissue around one side of the anus with destruction of the anal sphincter. The feces were discharged sideways and the rectal tissue was rolled outward, as is commonly seen in horses following defecation. From the examination of the vaginas in these cows it was evident that all had been recently affected.

Cultures were taken from a number of animals. The exudate from the vaginas and rectums was collected on sterile swabs for animal inoculation. Pure cultures of the Gram-negative bacillus, already mentioned as associated with granular vaginitis in cattle, were later obtained. The direct films obtained at the same time contained numerous typical bacilli. In most of the cultures taken at the farm, and in the laboratory subcultures, there was evidence of gas formation, indicating contamination with anaerobes.

The vagina of a Holstein heifer calf six weeks of age was brushed with a swab obtained from the vagina of a cow, and a similarly contaminated swab introduced into the rectum. The calf developed a typical case of vaginitis without showing any involvement of the rectum. A pure culture of the Gram-negative bacillus was recovered from the vaginal secretions. Swabs obtained from the cows on the first visit failed to infect rabbits by either vaginal or rectal inoculations.

May 23, 1932, the owner purchased a yearling bull and a fresh cow from the same cattle dealer. June 2nd, the cow

had a severe attack of vaginitis and the bull had a typical infection of the rectum. I visited the farm on June 3rd. The bull was uneasy and strained continuously. On rectal exploration the mucus folds were indurated and congested. On the right side of the rectum there was a deep fissure over 1½ inches in length. Fetid feces were passed frequently in small quantities. The cow had a severe infection of the vagina. The mucosa was swollen, congested, and completely covered with a thick, tenacious, adherent yellowish exudate. The infection extended into the vagina as far as artificial light could penetrate. The rectum was also involved although the process was not so severe as in the bull.

Cultures were taken directly from the vagina and swabs obtained for animal inoculation. As before, the cultures, although mixed with other organisms, showed the typical Gram-negative bacilli of the vaginal organism.

The direct films contained enormous numbers of typical bacilli. A Jersey cow was inoculated by inserting a swab into the vagina. Another swab was introduced into the rectum and briskly rubbed. The following day the mucous membrane in the vestibule of the vagina was peppered with small greyish-white ulcers. From the centers of these small ulcers cultures of the vaginal organism were obtained. On the 4th day the cow had a frank case of vaginitis. The animal was slaughtered. At autopsy there was no evidence of any involvement of the rectum. The vagina of a Holstein cow was brushed with a swab obtained from the vagina of the Jersey cow and this animal also developed a severe case of vaginitis. Pure cultures of the Gram-negative bacilli were again obtained from the vaginal secretions of this cow.

Conclusions

It is difficult for me to offer any plausible explanation of this peculiar type of ano-vulvitis occurring in cows and bulls. Certain facts, however, are worthy of special mention. Since the Gram-negative bacillus described by Jones and the speaker was isolated from each case cultured, it is reasonable to assume that this organism was responsible, to a certain degree, for this severe form of vaginitis. The presence of anaerobes in the cultures would suggest that these bacteria might be secondarily responsible for destruction of the vaginal and rectal tissues.

On the other hand certain facts indicate that the primary lesions might have been of a malicious nature. Although we have no actual proof for this statement, it seems significant that in all acute and chronic cases of rectal disease the tissue destruction was more severe on the right side of the anus. If the invasive organisms had reached the rectum by way of the digestive tract one would expect to find, on rectal exploration, a more generalized infection instead of a localization on the one side of the anus.

CONVULSIONS IN A BOAR

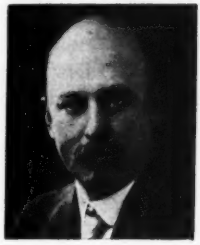
A Duroc Jersey boar weighing about 300 pounds, two years old, in good condition and not crowded in service lay around and upon being made to get up would begin to shake, placing his nose to the ground, would scoot along four or five feet and go down on his belly, and lie still with the eyes set. This condition would last about five minutes and then he would recover, but would continue to lie down. He had these spells for ten days, then was all right. The spells are not occurring at this time. What was the cause?—E. J. W., Illinois.

Reply: There are two general predisposing influences responsible for the condition mentioned. These two conditions are first, inbreeding, and second, some toxic absorption as a result of improper feed or delayed functioning of some of the digestive organs. I am inclined to believe that inheritance has nothing to do with this particular case, otherwise the animal would still show occasional attacks. It may have been due to some digestive disorder, absorption of products from the bowel or it may have been due to some local infection that has cleared up.—A. T. K.

Live Stock Health and Wealth*

By JOHN R. MOHLER, Washington, D. C.,
Chief, Bureau of Animal Industry, United States Department of Agriculture

TO greet audiences of stockmen and others interested in the welfare of our domestic animals is always a pleasure to me. This opportunity is especially welcome in view of the keen interest now being displayed throughout the South in raising and improving livestock. When asked to address you I recalled the experience of a veterinarian who also was the local constable. Late one night he received an urgent telephone call requesting him to come at once.



John R. Mohler

"Do you want me as a veterinarian or as a constable?" he inquired. Of course he wanted to be properly prepared.

"We want you as both," came the answer. "We can't get our bull-dog's mouth open and there's a burglar in it."

Such a combination of duties is typical of the broad range of services that those of us in the veterinary profession frequently encounter.

Doubtless you have learned from press accounts and other sources that the American Veterinary Medical Association is now holding its annual meeting here in Atlanta. It is the second time in 69 years that this organization has met in the Cotton Belt. Many of the delegates have traveled long distances to attend the sessions, to meet our southern colleagues and to observe, at first hand, livestock conditions in Georgia and nearby states. This convention should mean much to the South, for the influence of veterinary discussions and activities based on them is far reaching. Everyone is having a most wonderful time and even that uncertain factor, the weather, has been delightful. The ladies especially are enjoying every moment of their visit, thanks to the efficient, energetic, and untiring efforts of the Mesdames Mosher, Wright, Caughman, Kepp, and their capable associates.

No doubt many of you remember the various old beliefs about the cause of bloody murrain. There were also strange reports from some areas about cattle, horses, and sheep going crazy for reasons then unknown. Hog cholera, under various names, was rampant and the general business of raising livestock involved risks of a kind hard to combat. Attacks of infectious diseases came without warning. Long practical experience in the handling of livestock on farms and ranches was of no avail. The situation called for highly specialized study.

To understand better what the veterinary service has done for stock raising let us, for a moment, go back about 100 years. A century ago there were no veterinary colleges and consequently no trained veterinarians in this country. There were, of course, individuals who professed to understand and cure animal ills, but as a matter of fact, there was little dependable knowledge on the subject. A beginning in veterinary science had been made in France, largely with the object of saving horses injured in war and also of combating destructive animal diseases that were ravaging the country. In 1857 a veterinary college opened in New York City, and by 1892, only 40 years ago, four veterinary colleges were in operation. Thus the development of veterinary science and skilled practice in the United States has been comparatively recent.

On the other hand, stock raising is several hundred years old in this country and dates back nearly 5,000 years in the Old World. Most of the serious animal diseases and pests, such as the cattle tick and tuber-

* Radio address, Atlanta, Ga., Aug. 25, 1932. Broadcast under the auspices of the 69th annual meeting of the A. V. M. A.

culosis, entered this country in importations of livestock and spread extensively before the danger was realized.

It was to meet this condition that veterinary science and its application by the veterinary profession have developed. In contrast to unreliable beliefs and futile treatments, veterinary science combines definite knowledge with sound, humane procedure. Painstaking research is the first step. The next is to test the knowledge on a small scale, and finally these procedures lead to dependable methods of control and eradication.

Stock Raising Made Safer

Veterinary science skillfully applied gives stability and safety to stock raising. The cattle tick, once a vampire foe in 15 states, already has yielded to systematic dipping in Georgia and 10 other states and is now losing ground in the remaining four. Tuberculosis, once prevalent in about 5% of the cattle of the country, is also on the decline. Systematic testing and the removal of reactors have already reduced the infection to about 1.4%. This is a general average. Over large areas it has been practically eradicated while in a few localities it is still a serious menace. Here in the South the infection fortunately is slight, and I congratulate you on the aggressive action you have been taking to eradicate the disease entirely. The discovery of the serum treatment to prevent hog cholera has brought that disease under effective control so that hog raising is now one of our safest and most profitable branches of stock raising.

Let me remind you again that all this and similar progress is based on well-established facts concerning the cause of diseases and sound procedures of control and eradication.

Another point of interest regarding the veterinary profession is its small size. This is a result partly of the high educational requirements now in force. There are only 11 recognized veterinary colleges in the United States and the total enrollment is only a little over 1,000 students. To complete the course requires four years. Throughout the entire United States there are only about 10,000 graduate veterinarians, or approximately one for every 19,000 domestic animals not counting poultry and pet stock.

Because there are so few veterinarians in proportion to the number of animals, treatment must be planned largely on a mass basis. Individual veterinary service is limited in large degree to improved breeding stock, other valuable animals, and to pets having sentimental value. For the general run of market livestock, individual treatment is the exception rather than the rule. Such animals are often of insufficient value to justify individual diagnosis and treatment even if there were veterinarians enough to render the service.

Large Sums Spent for Worthless "Remedies"

Certain manufacturers have taken advantage of this condition. They have placed on the market vast quantities of preparations represented to relieve or cure animal ills. Doctor Moskey, formerly of the Bureau of Animal Industry and now an officer of the Federal Food and Drugs Administration, has given me some figures on the extent of this business. Last year, about 400 manufacturers marketed more than 8,000 preparations for treating livestock that were worthless for the purpose. These products were accompanied by unjustified claims or false statements of composition. This questionable business takes millions of dollars a year from the pockets of trusting livestock owners. Reliable figures for the country are not to be had, but a report from one state, Kansas, places expenditures last year for this class of goods at about half a million dollars for that state alone.

The Federal Government is doing all it can, under law, to stop such mislabeling and other misrepresentation. But especially in these days when ready cash is none too plentiful, this is a condition for livestock owners to consider seriously. If even half the money spent for nostrums were invested in sound procedure administered or directed by trained veterinarians, stock owners would

be money in pocket and their animals would be healthier and in better condition.

The best and cheapest general route to livestock health is sanitation under competent veterinary direction. Individual problems naturally require different methods—involving such things as dips, disinfectants, and biological products.

Human Health Sometimes Involved

There is still another side to livestock health, the influence of certain animal diseases on human health. Tuberculosis is a good example. This disease can be transmitted by raw milk, especially to children. The milk of a single tuberculosis cow may cause years of ill health, frequently a crippled condition through bone tuberculosis, and possibly death. I realize the natural reluctance that some of you may have in requesting the tuberculin test, especially when you believe your cattle to be healthy. One of our inspectors reported a case of that kind. In a family herd the test revealed one reactor. A physical examination showed also the probability of tuberculosis of the udder. In this family was a baby about a year old. Yet the father objected to the removal of this cow from the herd. After its condemnation, he informed the inspector that he wasn't afraid of the disease. He also said that he had taken the milk of the diseased cow to the house for family use. As the inspector was about to leave this home, after arranging the indemnity payment for the cow, the mother of the child followed the inspector to the gate. "Yes, it is true," she said, "that we have been using that cow's milk, but I saw to it that every drop was scalded."

This instance was, of course, exceptional and I am glad to say that most men and women are equally active in supporting this great useful work. Yet the incident shows the important part that women may take in supporting constructive veterinary service.

The press of the country also has been very helpful. A clipping that came to my desk shortly after the last outbreak of the dreaded foot-and-mouth disease in April, 1932, is a case in point. It was an editorial confidently stating that "this outbreak will be eradicated as have others in the past." There were no ifs, ands, or buts. The discussion combined confidence in veterinary service with assurance to stock owners. Moral support of that kind, of course, is a great stimulus to those engaged in the work. I am glad to report that the confidence was justified. Through excellent State and county cooperation the eradication forces conquered this outbreak of foot-and-mouth disease in 10 days. The United States is now entirely free from this foreign plague.

Healthy Animals Most Profitable

There is still another side of the veterinary service, often overlooked. We have seen how the service has met difficult situations. We have seen how it replaces fears with confidence. We have seen how it insures against loss. The application of veterinary science also increases the earning power and sale value of domestic animals.

Even supposedly healthy animals may harbor obscure ailments or parasites. Such animals fail to make normal gains and their production may be far short of their inherent ability. This knowledge has suggested the need for improved systems of management.

We now have several very successful plans by which stockmen are helped to free their horses from bots, their sheep from stomach worms, and their hogs from roundworms. Other systems apply to other parasites and diseases. This is a highly important development in veterinary science and in stock raising. In some cases the system begins with the birth of the animal, so that its health is protected from the start. As a consequence, death losses are greatly reduced and growth is more rapid. Under such systems there are few runty animals. The plans are simple and practical, and the benefits greatly exceed the small amount of trouble and expense involved.

In conclusion let me thank you and this station for the privilege of making this address. I trust that it may lead to a better understanding of our mutual problems and to more productive and profitable livestock.

Digestive Disturbances Due to Ingestion of Peanut Vines

By HERMAN J. MAGENS, Huron, South Dakota

THROUGHOUT the South West the peanut is widely grown, if not always as a major money crop, yet over wide areas as an accessory feed crop. It may be grown advantageously on almost any type of soil and under all sorts of conditions. In almost any sort of season it may be depended upon to furnish valuable roughage. It is regrettable that the peanut vine although containing a rather high percentage of total digestibles and constituting a highly desirable feed, must be held accountable for many gastro-intestinal disturbances amongst horses and mules often with mortal outcome. At the best, under favorable conditions a large percentage of fibrous material gives this roughage its bulk. Under unfavorable conditions due to frosts, rains, drought etc., nearly all foliage and peanuts will separate from the vines and roots leaving them with the stems to make up the major part of the bales. Add to this the almost unbelievably large quantities of sand, gravel and other foreign material mixed in with the baled hay and one has a predisposing factor for all manner of gastro-intestinal disturbances of the equidae, which are very susceptible to these affections anyhow. One must also consider that this type of hay spoils exceedingly fast, perhaps because of the large proportion of stems and roots.

Anamnesis, even if arrived at by careful questioning is of relative value only. Many rather important symptomatic phenomena seem inconsequential to the layman and therefore remain unobserved, unrecorded and untold. For this reason physical diagnosis based upon a thorough knowledge of the normal physiology of the digestive processes of equines becomes all important. We all realize that the term "colic" is just a convenient name for a large group of gastro-enteritic disturbances. Their differentiation and classification is in many cases almost impossible, since general symptoms become so intense and severe, that they cannot be interpreted for the purpose of localizing topographically the seat of the affection or its cause. Common to all "colics" however is a modification in one way or another of the normal, physiological, progressive forward motion of the intestinal contents from one sector to the next. That is to say in all colics there is a disturbance of physiological peristalsis. Its overstimulation, its depression or its suppression is of importance in pathological changes. One must necessarily learn to differentiate between cases, where overstimulation of this phenomena is observed or where atony or lack of this function becomes apparent. With practice one will easily learn to separate the spasmodic from the paralytic type of cases and knowing, that they are peculiar to certain portions of the intestinal tract make use of this knowledge therapeutically.

To do this properly numerous predisposing factors, the majority of them due to faulty feeding and stable management should be taken into consideration. Improper feeding both in quality as well as quantity often causes colics of one kind or another. Likewise feeding at irregular intervals causing greediness, and poor mastication, due to abnormalities of the teeth is also productive of harm. Impaction of the colon is often so caused. Underfeeding for instance during enforced long marches during maneuvers is also responsible for colics. Lack of water or chemically impure water is a fruitful cause of intestinal disturbance, particularly in animals fed on peanut hay, since much more water than usual is needed for proper digestion and forward motion of this particular feed to keep it from packing tightly in the intestine.

The symptoms of colic due to peanut hay differs according to the type involved and

does not differ materially from that due to other types of feed. Generally speaking the animals become restless at first. They often begin to paw and kick. They shake themselves frequently. They try to roll. They shift the bodyweight continually. They kick the abdomen as if fighting flies or lash out behind viciously. They turn to look at their flanks. Sometimes they stand with their legs stretched out far or tucked well under their belly. They yawn and retch and belch. Attempts at micturition and defecation have also been observed. In some instances these symptoms will subside rather quickly, in others they will become gradually more severe, to let up just before death ensues. Unphysiological positions have been observed frequently. They may kneel or sit dog-fashion. Sometimes they act normally at intervals, sometimes they become destructive, running into buildings, fences, etc.

Expulsion of gases through the rectum may be interpreted favorably as to prognosis, the same is true for loud continued intestinal sounds and murmurs. Auscultation of the lungs is difficult in these cases, since abnormal intestinal sounds often make one mistake them for thoracic rales. Perspiration is often observed, especially so at the base of the ears, on the side of the neck, the lateral portions of the belly, the flanks and in between the hindlegs. All these areas may appear either excessively hot or cold to the touch.

Respiration is frequently accelerated and forced, in some advanced cases even dyspneic.

The pulse rate will rise to 50 to 60 per minute, in fatal cases it may run as high as 150; becoming increasingly hard, wiry and small. This speaks for a very poor prognostic outlook.

Visible mucous membranes are often pale, then again of a dirty discoloration, varying from a bluish to a greenish or even yellowish color. In very severe cases they may become deep red, nearly purple.

The buccal cavity appears dry often covered with slimy discharge.

Feed and water are refused in most cases.

Defecation is either retarded or completely stopped. The feces appear dry, of small formation, if formed at all, dark brown in color, usually covered with mucous patches, which again are flecked with blood. In other cases however the feces are soft and doughy, similar to that of diarrhea. They are sour, the material seems poorly masticated and digested, often showing ingested materials unchanged.

Micturition is mostly retarded. The animals will frequently go through the motions peculiar to that act, yet just a few drops of urine will pass; although the bladder may appear very full upon manual exploration.

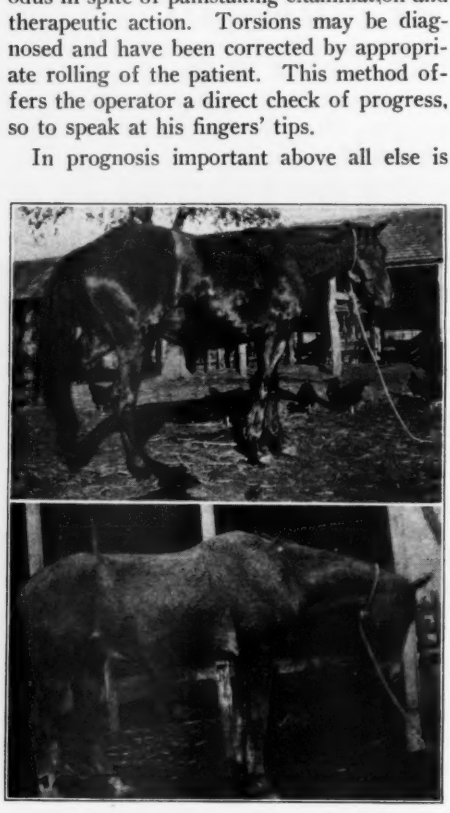
Peristaltic sounds are a valuable aid in diagnosis. Physiologically they are always present, Tympany and impaction are indicated by the absence of borborygmi. If the sounds appear of higher tone values one must conclude that the organ involved is more or less tympanitic.

The next step in diagnosis is the manual exploration of the pelvic cavity—the rectal examination. Lukewarm water injected will aid this exploration materially. By this examination obstructions, impactions, ruptures, tears, torsions, invaginations, etc., may be recognized and this information used to decide upon the proper therapeutical measures and as a basis for prognosis. In order to explore a larger field it may be advisable to stand the patient lower behind bringing some of the more anteriorly situated organs within reach of the operator. Before attempting this exploration it is well to familiarize oneself with the physiological position of the bowels and with their structural difference, such as muscular bands, etc.

When dealing with peanut hay or peanut vine digestive disturbances we will mostly deal with obstructions or partial torsions of the colon and its flextures. Most of these colonic impactions are located in the pelvic flexure of the colon and if the impaction is very large the ventral flexure of the organ will protrude into the pelvic area where normally the small colon and its prolongation, the rectum, are located. Impaction of the small colon is rather easily palpated and diagnosed. Very important in prognosis is

the condition of these organs. If highly inflamed the prognosis should be guarded; autointoxications lead rapidly to a lethal exodus in spite of painstaking examination and therapeutic action. Torsions may be diagnosed and have been corrected by appropriate rolling of the patient. This method offers the operator a direct check of progress, so to speak at his fingers' tips.

In prognosis important above all else is



Above: Impaction due to Peanut Vine hay. Below: Cerebro-Meningitis due to the ingestion of Peanut Vine hay

the general appearance of the patient; of lesser importance for the final outcome are the peristaltic and intestinal conditions, which may change very rapidly, adjusting themselves to the animal's general condition as a rule. A glassy, staring, frightened look, dilated pupils, sunken eyes, cyanotic, deep red or greyish conjunctiva, cold ears, cold perspiration, cold extremities, dyspnea, tympany, trembling, swaying, yawning, forced motions and last but not least prolonged unphysiological positions are indicative of anything but a rapid recovery. The pulse rate affords a very good check upon the progress the animal is making. If severe spasmodic conditions are followed by an apparently normal quiet appearance, especially in the wake of some medication and if at the same time subnormal temperatures may be shown, a slight trembling, weak pulse, etc., collapse and death are near.

Prognostically favorable of course is the condition where the peristalsis becomes normal again, when tympany disappears gradually and the pains subside without any signs of collapse. I have always made it a practice to make a very guarded prognosis in all colic cases, especially those where I have learned the principal causative agent was peanut hay or the peanut vines. The physical properties of that feed as well as the physiological functions of the large colon just seem to invite trouble unless special precautions have been taken to guard against them.

Perhaps no other group of animal diseases call for such careful precautionary measures as these so-called colics. Certainly no other group of animal diseases calls for more diagnostic skill than this group. Only those therapeutical measures which are based upon these findings offer a measure of success.

All therapeutic measures have to be based upon the symptoms, their removal and the causative agent and its removal. Meyer has shown recently that injections of water are able to reach the colon from the rectum, he has constructed a rectal speculum through which these injections may be made safely. The instrument must be left *in situ* until the animal ceases to strain. It is remarkable how little water will escape even after the removal of the injection apparatus. I prefer lukewarm salt solution for the injection. Another very effective way to bring about the return of normal peristaltic action is the application of cold packs. Several sheets are saturated with cold water, fastened around the animal's abdomen and covered tightly with blankets. Mechanical measures include also manual massage of the parts involved if they can be reached from the rectum. If there is any tympany at all the use of the trocar is always indicated. The gases will

escape and allow the intestinal contents to resume their forward motion. The operation itself, if done with proper precautions is harmless. In a restless patient the simple method of venesection has been very effective; it is not dangerous. With regard to medicinal agents one must keep in mind that the choice of the drug must depend upon the action wanted. If one has been successful in breaking up impactions, arecoline and pilocarpine are indicated, they cause an enormous secretion of intestinal juices and thereby aid mechanically in the propulsion of the material causing the impaction and obstruction as well as stimulatory peristalsis. Otherwise they should not be used. The salines together with aloes have given me best results where manual massage and consequent breaking up of these ingesta proved impossible. Camphorated oil hypodermically has given best results in my practice as a stimulant. The stomach tube not only offers a ready means of administering these drugs but helps materially in bringing water to the parts of the intestinal tract mostly involved, the colon and its flexures. Chloral hydrate is my favorite sedative. It may be given also by the stomach tube and bring more needed water to the affected portions of the intestinal tract. The use of a large number of drugs, especially drastic ones, is contraindicated. Hydrotherapy is the best means to a successful termination of most cases. Medication should be just sufficient in strength to assist nature to resume its normal functions, no more, no less. In cases, where this method fails, recovery is usually impossible, as subsequent post mortem examination will prove. Autopsies are indispensable in the cases that one loses. They allow the doctor to check his findings upon rectal examination. They are also very useful in convincing the owner that everything possible had been done and that no manner of skill and medication could have been successful in moving ingesta as I have encountered them in colonic impactions due to peanut hay and vines. Enormous in size, weight and circumference, they were matted and of a tough consistency reminding one of felt.

VOMITION IN A COW

I was called to see a Jersey cow, six years old. She vomited up her food in two or three hours after eating, plastering up the walls of her stall with the contents of her stomach. She did this for two or three weeks and weakened down and died. Food considered good, consisted of ground corn and wheat and pea hay. Would like to know the cause and proper treatment.—E. J. W., Ill.

Reply: This is a condition we see quite often and, so far as I know, it is due to no one particular cause.

We can probably eliminate tooth trouble and throat trouble, since she does not vomit until two or three hours after she has eaten.

If she suffered a dilation of the cervical portion of the esophagus you would probably detect it; if of the thoracic portion you probably could not. Such impediments are described in text books under the title of *jabot*.

The probabilities are that the trouble was located in some of the stomachs, maybe due to a growth or a constriction and, so far as I know, there is no treatment for it.

If the vomiting should be due to reflex action, then drugs may help some. You might try any of the dozen and one things that are recommended for it. My experience has been that drugs do not amount to much in such cases, but of course, again that depends upon the form. If it is more of a functional derangement, such drugs as nux vomica may have positive merit and it is well to try them on all similar cases where a cause for the ailment cannot be determined.—J. F. DeV.

Demay (Bul. Soc. Veter. Pratique) reports a case of a dog, two and one-half years old, that had an umbilical hernia and died showing symptoms of double pleurisy. On autopsy a hernial ring was found in the diaphragm through which the small intestine and omentum had become invaginated into the pericardium, which formed the hernial sac.

Incubator and Hatchery Sanitation and Inspection*

By C. A. BRANDLY, Manhattan, Kansas
Kansas Agricultural Experiment Station

THE problem of incubator and hatchery hygiene presents some aspects not encountered in the branches of the live stock industry other than poultry. Vast numbers of chicks originating from widely scattered breeding flocks are hatched, brooded and distributed together under conditions ideal for the dissemination of infectious diseases. Hatcheries in California may not infrequently obtain eggs from the middle west, while Oregon hatched chicks may be delivered to the Oklahoma poultryman at less than three days of age.

The modern commercial incubator affords a striking example of a means, as effective in mechanically distributing infection to its residents, as it is efficient in hatching them in almost incredible numbers. This has created a situation unexpected and unparalleled in the struggle against infectious disease.

Healthy chicks come from healthy flocks and clean incubators. Simple cleanliness supplemented by fumigation of incubators and incubator rooms may appreciably reduce the spread of pullorum disease in chicks at the time of hatching. These measures are also essential in suppressing other contagious diseases of young chicks, particularly laryngo-tracheitis and infectious omphalitis.

Notwithstanding the value of physical cleanliness and disinfection in preventing the dissemination of disease in incubators, these measures are in no sense a substitute for a testing program to eliminate pullorum disease, through attack at its most vulnerable point, the diseased breeding flock. Chicks from pullorum infected eggs are not cured by sanitary measures employed in the hatchery. The spread of pullorum disease to healthy chicks at hatching time may, however, be greatly minimized by cleanliness and fumigation of incubators.

*Publication No. 145, Department of Bacteriology.

During the past three seasons in addition to the scourge of pullorum disease, the hatcheryman has encountered an apparently equally serious, but more insidious enemy in the highly contagious laryngo-tracheitis of baby chicks. This disease, attributed to a filtrable agent, manifests the basic features and peculiar control problems of the filtrable virus diseases. Its transmission through the eggs in the same manner as pullorum disease has been suggested but not proved, while there is evidence to indicate a greater facility for spread by indirect contact than is the case with pullorum disease. At the same time, sanitary and fumigation procedures in the hatchery are limited by the same factors that circumscribe attempts to eradicate pullorum infection in the presence of infected individuals.

From the hygienic standpoint, infectious omphalitis appears to present the least serious problem of the diseases mentioned. It seems to thrive particularly under conditions of insanitation and high relative humidity. High humidity of the air of the incubator preceding and during hatching may delay proper closure and healing of the umbilicus and thus favor entrance of mass infection, particularly that of fecal origin. Consequently, the factors other than sanitation which may tend to limit the spread of certain infections may favor infection of the umbilicus.

Sanitary Standards and Procedures

A. Physical Cleanliness Fundamental. Selected hatching eggs from healthy, tested, vigorous flocks to reduce the amount of egg-borne infection are essential requirements for sanitation in the incubator and hatchery if the desired results are to be expected. This necessitates proper facilities to insure physically clean eggs, properly

handled and delivered to the hatchery in clean containers.

Scrupulously clean incubators, in properly located and constructed buildings, safeguard the precautions taken regarding hatching eggs. Before the hatching season starts all excess, as well as movable material and fixtures should be removed from the hatchery and the incubator. The walls, floors, ceilings and entry ways should be washed and sprayed with a reliable disinfectant. The movable equipment, including particularly tables, egg and hatching trays, should be cleaned by scrubbing with a steel brush and scalding hot lye water (one pound of lye to 30 gallons of water). After cleaning, the trays should be dried and disinfected.

Since in the routine of operation, incubators and incubator rooms are subject to an accumulation of dirt, dust and contaminated down; frequent, regular cleaning and disinfection must be carefully and systematically followed. During the hatching season, removal of all visible dirt, egg shells, droppings, and down at least once a day is essential. The down may be removed readily by means of a vacuum cleaner with special attachment. The trays should be cleaned, dried and disinfected after each hatch. Moisture pans, should be emptied, scrubbed and disinfected frequently. A suitable disinfectant to prevent bacterial growth should be added to the fresh water.

For collecting the refuse, easily disinfected containers accessible from the incubator room but preferably outside of it, should be provided. Daily cremation of all refuse is specified by Paragraph 2, Section 5, of Oklahoma Regulation No. 9. The practice of feeding unsterilized infertile eggs and dead embryos from the incubator frequently has resulted in serious trouble. Boiling or its equivalent for a period of five minutes has been found necessary to insure the destruction of *S. pullorum* in infertile infected eggs.

Failure to observe strictly these fundamental standards and requirements is largely responsible for the fact that disease, once established, may grow steadily more damaging as each succeeding hatch is taken off. Thus many hatcherymen report that they receive no complaints from early hatches, but later in the season the vitality becomes progressively poorer; the losses progressively higher.

B. Disinfection and Fumigation.

For the disinfection of eggs, hatching trays and other equipment any of the following chemical agents[1] may be used at a very low cost.

1. Compound solution of cresol, U.S.P. (Liquor Cresolis Compositus), approximately a 3% solution or other approved coal tar disinfectant.
2. Chlorinated Lime ("Chloride of Lime") approximately a 3% solution.
3. Carbolic Acid, approximately a 5% aqueous solution of *crude* carbolic acid.

These disinfectants may be applied by washing, spraying or immersing. Rubber gloves should be used to protect the operator's hands.

For destroying pullorum infection on the area proximal to the hatchery as well as the soil around the poultry houses, the Tennessee Experiment Station[2] suggests that a 5% solution of sodium acid sulfate be applied at the rate of one gallon per square foot. This agent possesses advantages in low cost, does not injure the subsequent growth of vegetation and was found to prevent range infection on previously contaminated areas.

If the incubator is kept clean formalin fumigation at the time of hatching will destroy infection. Several methods of releasing formaldehyde in the incubator[3, 4, 1] and hatchery rooms have been employed. In general, the application has been largely to so-called forced draft incubators because the air circulation facilitates efficient germicidal activity of the gas. The spread of infection is likewise hastened with the more rapid movement of air but well controlled experiments[5] have shown that this does not justify the implication that there is little or no air borne transmission of infection in the still air type of machine.

Experiments conducted at the Kansas Experiment Station[3] indicate that the formalin-

potassium permanganate method is the most efficient method of fumigation and the most easily applied (40cc of formalin and 20 grams of potassium permanganate per 100 cu. ft. of incubator space). Twenty-four hours before each hatch the incubator should be fumigated with double amounts of formaldehyde to destroy latent and mass infection. Before eggs are placed in the incubator as well as while the hatcher is empty, a triple strength fumigation may be carried out. Eggs will not be injured by repeated fumigations with double amounts of formaldehyde but chicks should not be exposed to these amounts. Hatching chicks are tolerant to amounts of formalin that possess distinct germicidal properties for *S. pullorum* and a great share of the other micro-organisms ordinarily present in the machine. However, chicks of low vitality as a result of hereditary, environmental or other factors may be injured by routine fumigation. Chicks more than 48 hours old should not be subjected to formalin fumigation by the same procedure used for hatching chicks. The physiological consideration of early development of the air sacs and other respiratory appendages make the reasons for this quite obvious.

The relative humidity should be approximately 68% (a wet bulb reading of 90°F. when the dry bulb reading is 100°F.). Proper humidity reduces the circulation of dust particles and down, favors hatching, and facilitates the germicidal action of formaldehyde. Particular precautions to avoid stopping of fans must be taken during the time hatching chicks are being fumigated Avoid the use of old solutions of formaldehyde or those showing marked precipitates and those having been exposed to the air in unstoppered containers.

C. Ventilation and Humidity.

It is obvious that an incubator will be only as clean as the room in which it is located. Improper ventilation of the building and the machine mitigates the value of the most stringent sanitary measures. Manufacturers have recognized the necessity of securing a pure air supply for the incubator, and to avoid the danger of contaminating the air outside the incubator house. This is accomplished by providing intakes from the outside and a ventilation system which avoids the forcing of exhaust air directly to the outside of the building.

Dirt and dust from the floor of the hatchery is particularly dangerous as a source of contamination and great care should be used to keep the floors clean.

A precaution to be observed in maintaining the accuracy of the wet bulb thermometer is to avoid the collection of dust and down on the exposed wick in such quantities as to alter the rate of evaporation. Frequent changing of the wet bulb wick avoids inaccurate results in many instances.

Inspection

Inspection work for the furtherance of disease control programs has as its object the dual purpose of education and regulation. Unless preceded or accompanied by judicious yet persistent educational efforts toward developing the demand for and a knowledge of the scope of the control program, its success is jeopardized at the outset. Only when the hatcheryman appreciates the fact that a program leading to disease control will actually and ultimately yield him a profit will he cooperate to the fullest extent. That this end may be accomplished without a great deal of time and effort is not to be expected. However, certain considerations other than the appeal of direct increased monetary returns through rigid compliance with the regulatory requirements and principles should not be overlooked.

The necessity of scrupulous sanitation in all the operations in the hatchery may in some cases be promoted by offering the comparison of this establishment with a hospital. The many advantages of wearing white clothing by all engaged in incubator and hatchery operations have been recognized and many progressive hatcherymen have adopted the practice.

From the regulatory standpoint careful inspection is an important means of supporting and furthering the disease control program. Conscientious attention to detail by properly trained and intelligent attend-

ants will do more to insure the success of disease control than haphazard inspection of a broad general nature. The program outlined in Oklahoma suggests a close cooperation of the hatcheryman and the veterinarian in that free choice is allowed the poultryman in selecting the veterinarian for supervising the collection of samples, clean up measures and other phases of pullorum disease control.

A systematic procedure for carrying out hatchery inspection is essential for efficiency and thoroughness. The logical method would suggest first, a careful general inspection of the premises from the standpoint of location of the buildings, proximity of the units, nature of the soil, access to sunlight, and drainage. A good location on a well drained area, the soil of which is quite pervious, is an important factor in minimizing the hazards of insanitation and disease.

Allen and Jacob[2] report that *Salmonella pullorum* may persist in a virulent condition in both red clay and rich black loam for at least 14 months. On the other hand, it was found that the organism had completely disappeared from sand by the end of the tenth month.

To facilitate destruction of infection by other natural agencies, unshaded direct exposure of each unit or building and surrounding areas may be emphasized and encouraged. Not only proper separation of the units or buildings as provided for in the regulations but the provision of facilities to prevent contact and probable transfer of infection from one building to another should be emphasized in this phase of the inspection.

Proper construction of the buildings or units housing the incubators, receiving and shipping rooms is important from the standpoint of disease control as well as of economy of operation. A ventilation system which will, under all conditions, prevent reentrance of used or exhaust incubator air into the building or machine, is the first requirement to safeguard against disease dissemination. As previously mentioned, satisfactory ventilation systems have been devised by many of the incubator manufacturing concerns.

In inspecting the incubator, differences in construction and principle of the machine, depending upon whether it is of the so-called forced air draft, stirred air or the still air type must be taken into consideration. With regard to formaldehyde fumigation practices, the greater the humidity of the air and the speed of the air currents at a given temperature, the more efficient formaldehyde fumigation becomes. In compartment or "still air" machines or units of such machines it has been suggested that formaldehyde fumigation may be satisfactorily applied by opening the machine before treating the entire incubator room.

Oklahoma Regulation No. 9 provides that egg containers be promptly returned or immediately destroyed by incineration. The requirement that baby chicks be disposed of in the original containers and not placed in brooders in the same building is designed to further minimize the hazard of infectious disease.

In addition to inspection of hatchery sanitation and hygiene the Regulation requires veterinary supervision in the taking of blood samples for the agglutination test, the physical examination of the flock, the removing of reactors and the cleaning and disinfecting of premises. This service offers an excellent opportunity for the practitioner to further his knowledge of poultry disease control while rendering valuable service to an industry potentially greater in scope than some of the other branches of the live stock industry.

REFERENCES

1. Incubator and Hatchery Hygiene. Animal Pathology Exchange, University of Illinois, Agr. Ext. Service, January, 1932.

2. Allen, P. W., and Jacob, M. Sodium Sulphate as a Disinfectant Against *Salmonella Pullorum* in Poultry-yard soils. Bull. 143, Tenn. Agr. Exp. Sta. (1930).

3. Bushnell, L. D., and Payne, L. F. Dissemination of Pullorum Disease in the Incubator. Tech. Bull. 29, Kansas Agr. Exp. Sta. (1931).

4. Dakan, E. L., and Speer, Fred. Sanitation in the Hatchery. Bull. 90, Ohio Agr. Col. Ext. Service (1929).

5. Bunyea, H., and Hall, W. J. Transmission of Pullorum Disease (Bacillary White Diarrhea) in Incubators. Jour. Agr. Res. 40:3, 209-223 (1930).

Atlanta Meeting of the A. V. M. A.

W. F. Guard
Columbus, Ohio

Tait Butler
President 1900-01

The 69th annual meeting of the American Veterinary Medical Association, held at Atlanta, Georgia, August 23-26, 1932, was a successful meeting from every point of view. The attendance was large for a meeting held so far from the center of veterinary population. The total registration, close to 600, was nearly double estimates made before the meeting by members who have attended meetings in various parts of the country for many years. The veterinarians, in attendance, numbered about 400, and included probably a larger percentage of those resident within a 300 mile radius of the meeting than have attended any previous meeting.

The weather, always a matter of concern in August, was favorable. During the first half of the week of the meeting, it was pleasant indeed and even at the clinic, although it was warm, the heat was not oppressive.

As is to be expected in a meeting held in the southland, social features were emphasized and everyone, without exception, had a good time. The entertainment provided the ladies in attendance at the meeting proved very much to their liking, and they were emphatic in their praise of the local committee.

The clinic and barbecue held on the last day of the meeting marked probably the high point in interest during the whole meeting. No setting could have been more nearly perfect for either the barbecue or the clinic. It was held at the Lakewood Fair Grounds, but a few miles from the center of the city, where on pine clad hills and amidst artificial lakes, numerous commodious exhibit buildings have been constructed for the state fair. Two of these buildings were com-

C. J. Marshall
President 1913-15
Secretary 1910-13

W. H. Welch
President 1922-23

A. E. Wight
Premier Tubercle bacillus exterminator

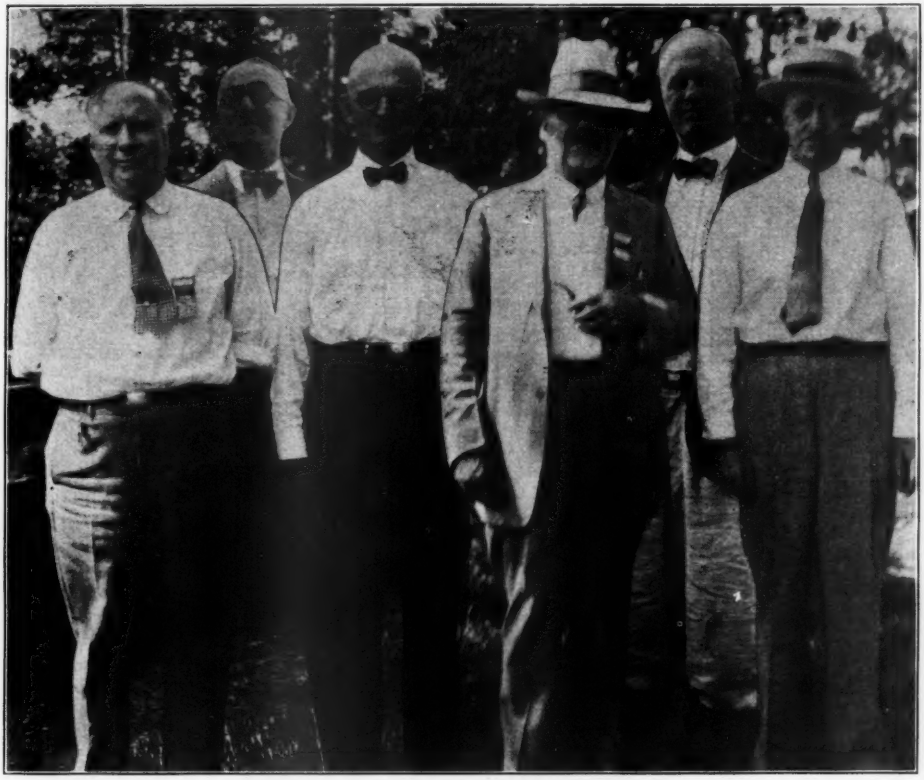
C. P. Fitch
Premier Br. abortus fighter

mandeered by the veterinarians, one for serving the barbecue lunch and the other for the clinic. Both were perfectly adapted to these uses; large beyond requirements, amply provided with seats and well lighted.

The clinic was ample in quantity and in quality beyond criticism. It held the attention of a greater number of veterinarians for a longer time than any other feature of the meeting. The operations scheduled were the unusual ones, giving the superior surgeons who took part in the demonstration, ample opportunity to exhibit their skill.

Several exhibits were conducted in connection with the clinic and received their full share of attention. One was the De-Laval equipment for the production of clean milk. A similar exhibit was shown at the Kansas City meeting last year. It is a milking machine and a milk cooler combined. The milk is drawn by a "pulsation control" machine which is as accurate as the swing of a pendulum, weighed, run through pipes to the cooler and on through other pipes to the bottling machine without having come in contact with the air. This machine is fast eliminating the last vestiges of prejudice that was engendered years ago by inefficient types of milking machines. It facilitates the production of clean milk and at the same time is practical and economical for the dairyman. The De Laval exhibit elicited much favorable comment from the veterinarians in attendance.

A poultry exhibit consisted of fresh



Left to right: J. N. Frost, Ithaca, N. Y.; T. E. Munce, President 1928-29; T. A. Sigler, President 1926-27; A. T. Kinsley, President 1921-22; G. A. Dick, Philadelphia; S. L. Barrett, Fort Dodge, Ia.

specimens arranged to show the lesions of tuberculosis and others to show internal parasitic infestation of birds. The carcasses of rabbits showing the effect of the injection of hormones present in the urine of pregnant females constituted another exhibit, and occasioned much favorable comment on this new pregnancy test.

Since all business matters in connection with the Association are now acted upon by the Executive Board and their recommendations reported to the Association for routine approval, there is less interest in such matters and far less discussion of them than there used to be when such matters came before the Association for consideration.

However, the report of the Committee on Biologics received more than usual comment. The committee recommended that biologics offered for veterinary use should be classified into two classes, those that are satisfactory to the Association and those that are unsatisfactory. This recommendation was approved and the committee instructed to make its recommendations in accordance therewith at the next meeting.

The Committee on Education brought up the long-deferred matter of classifying the veterinary colleges of North America. It purposes to classify these schools into grades A, B and C, the classification to be reported and to take effect at the 1935 meeting.

The Organizing Committee for the Twelfth International Veterinary Congress held a number of sessions, at which preparations for holding the Congress in this country in 1934 were considerably advanced. The committee presented tentative plans for the meeting necessitating the expenditure of a sum estimated at $38,000, and plans for raising a fund of this amount. They were approved by the Association. The committee asked an additional $5,000 from the A. V. M. A. ($5,000 having been ap-

Ashe Lockhart
Kansas City, Mo.

H. Preston Hoskins
Secretary-Editor

C. A. Cary, President 1919-20; N. F. Williams, President

N. S. Mayo
Chr. Com. on Education

H. J. Shore
Fort Dodge, Ia.

propriated for the use of this committee last year) and this was unanimously granted.

Top, left: E. B. Dibbell, Baltimore; E. E. Sweebe, North Chicago, Ill. Center: G. G. Graham, Kansas City; A. H. Quin, Jr., Des Moines. Lower: J. A. Campbell, Toronto; A. Eichhorn, Pearl River, N. Y.

A tentative list of United States members who will present papers (reporters) at the Congress and the subject that each is to discuss, was formulated. This part of the program requires the approval of the Permanent Committee of the Congress, which will meet in Paris soon, and following that it will be published as and when approved by the Permanent Committee. Adolph Eichhorn, chairman of the Organizing Committee of the 1934 Congress, was instructed to attend the Permanent Committee meeting in Paris this fall.

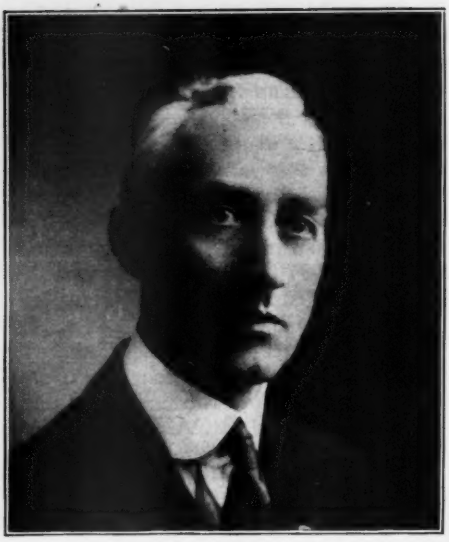
The committee recommended that the Twelfth International Veterinary Congress be held in New York City in August, 1934, and that the A. V. M. A. hold a business session in connection therewith but have no regular program that year. This recommendation was approved.

The report of the Committee on Agricultural Extension and a paper by C. W. Warburton, Director of Extension Work

C. H. Stange
President, 1923-24

of the U. S. Department of Agriculture, probably occasioned more informal discussion among the members of the Association and more concern than any other one feature of the meeting.

For a good many years, the flagrant abuses of the Extension Service of the U. S. Department of Agriculture and of various state agricultural colleges and experiment stations, have caused the veterinary profession as a whole a great deal of concern. It has always been held that the activities of county agents and others in the Extension



R. R. Dykstra
Past President. Made an excellent presiding officer during the Atlanta meeting

Service, invading the prerogatives of veterinary practice, was a misuse of public funds and an abuse of governmental functions. Veterinary associations in several of the states where the abuses have been most flagrant for more than ten years have endeavored to bring about their correction, but have constantly seen the abuses extended during that time. For the past two years, the A. V. M. A. has endeavored to effect a correction of these evils through the office of the Direction of Extension Service in Washington. Although certain favorable promises of action were obtained from Washington, the abuses not only have not been corrected, but have steadily grown worse, in at least some states.

Doctor Warburton's paper dashed any hopes the profession may have that the pernicious activities of the county agents in interfering in the field of veterinary practice may be discontinued by direction of his office. In fact, his paper constituted one of the most revealing records we have heard of the growth of bureaucracy in the Federal government during the past decade. Doctor Warburton's department was established in 1916 with a federal appropriation of $480,000. The original appropriation for agricultural extension has been increased, on the average, more than 100% yearly until now it has reached the enormous total of $10,000,000. And, this is not all, for the matter is carried on cooperatively with the states, the total appropriations of the latter aggregating about $15,000,000. Obviously this department has contributed its full share and more to the tax-created ruin that has engulfed agriculture, trade, manufacturing and all other industries. In fact it has been a leader in the unchecked expansion of paternalistic and socialistic services, and in the riotous extravagance that has characterized all government in this country since the war.

New York veterinarians in attendance at the Atlanta meeting. Left to right: W. H. Kelly, Albany; J. F. DeVine, Goshen; H. K. Miller, Mamaroneck; E. B. Ackerman, Huntington; Earl Sunderville, Ithaca; and A. Eichhorn, Pearl River

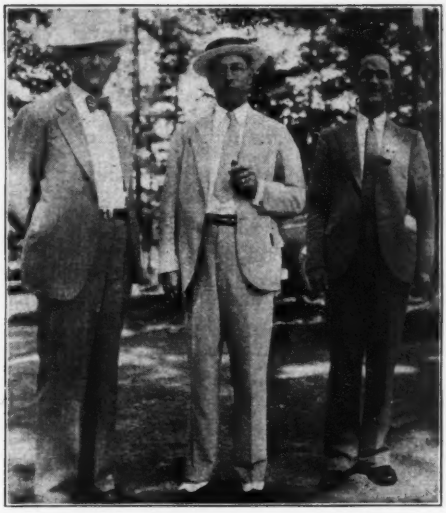
From Kansas City. H. E. Curry and A. T. Kinsley. The canes not necessary to locomotion added éclat to the occasion

E. J. Frick, R. R. Birch. Frick left New York for Kansas and Birch left Kansas for New York, just to even up things

The number of employes has increased proportionately until now there are about 6,000 directors, supervisors, county agents, home economics demonstrators, etc. Starting out as a war-time effort to increase agricultural production, the department has grown and grown and every year invaded new fields of private or business activity wholly foreign to governmental function, and now we find it attempting to correct thumb sucking among babies, tardiness among school children, preparing romper patterns for mothers, studying window blinds for the farm house and the length of bed sheets, supplying anti-hog cholera serum and virus and demonstrating its use to the farmer, purchasing fertilizers and seed for field crops, etc., and deluging the country meanwhile with a perfect flood of press releases telling how good it is and inconsequential bulletins to record its activities. No profession however strongly entrenched can successfully compete with such a gargantuan octopus supported by general taxes, nor ought it be required to. Doctor Warburton's suggested remedy is still more government in veterinary practice. That is, that veterinarians be added to the extension workers.

Apparently the remedy lies not in attempting to persuade the Extension Service to confine its activities to legitimate governmental functions, but in showing the Congress that the vast appropriations it has made for this service are being largely wasted and misused to the detriment, not to the benefit, of agriculture. That will be a difficult task for a profession so small in numbers as is the veterinary profession; but it is vital.

The next meeting of the Association is to be held in Chicago, probably the week beginning August 13th. There is a considerable demand for a five-day session. Monday and Tuesday to be devoted to small animal practice exclusively, Wednesday to business matters, and Thursday and Friday to large animal practice; thus affording those not at all interested in small animal practice or in large animal practice, two full days to visit the Century of Progress Exposition.



R. C. Julien, Indianapolis; E. A. Cahill, Chicago, and John Wells, West Palm Beach, Fla.

It was decided to hold the 1934 meeting in New York City in conjunction with the Twelfth International Veterinary Congress and to have no program, the meeting to be merely a business session extending over probably not more than one-half day.

The Association received invitations to meet in Havana, Mexico City and in Toronto in 1935. The indications were that Toronto is the favorite.

There was no contest in the election of president, N. F. Williams, State Veterinarian of Texas and runner-up in the presidential contest at Kansas City last year, being unanimously chosen. The five vice presidents too were selected without contest. They are: Col. Robert J. Foster, Fort Bliss, Texas, first vice-president; Geo. B. Faville, Richmond, Virginia, second vice-president; W. A. Axby, Harrison, Ohio, third vice-president; J. A. Campbell, Toronto, Ontario, fourth vice-president; and G. A. Dick, Philadelphia, Pennsylvania, fifth vice-president. M. Jacob, Knoxville, Tennessee, was reelected treasurer for his fifteenth term. R. S. MacKellar, New York City, Member-at-Large of the Executive Board, and Chairman, was reelected for another five-year term.

Reviews and Abstracts

By FRITZ VOLKMAR, Columbus, Ohio

Bronchopneumonia Among Horses

Gysler, Max. Die Bronchopneumonie bei den Irländer-Pferden der schweizerischen Kavallerie. (Bronchopneumonia among the Irish horses of the Swiss Cavalry.) Thesis, the University of Bern. 85 p. Lüdin & Co., Liestal, 1928.—The Broncho-pneumonia is a disease entity with irregular, variable fever curve. The course is an insiduous one with frequent recidivations. The most pronounced symptom is dyspnea complicated usually with angina, less often with distemper. Convalescence extends over weeks and even months. It seems to be identical with Brüssels or Ghent disease. The etiology is still obscure. Bacteriological examination of the nasal secretion discloses diplococci, streptococci and staphylococci. The microscopical lesions of the lung are always located in the apex and the cranioventral tip of the main-lobe. The liver exhibits fatty infiltration, necrosis, stasis, hemosiderosis; the kidneys show round-cell infiltration and hemorrhage. Diagnosis is based on the respiratory symptoms: mixed dyspnea with pronounced pumping of the flanks and play of the nostrils. Intensified or weak dry râles, vesicular respiration, percussion negative, cough losing its strength with the duration of the disease, nasal discharge turning bluish after 2-3 weeks, irregular fever curve. The continuance of dyspnea will differentiate it from bronchitis or bronchiolitis. Positive results from percussion and the fever curve will differentiate it from lobar pneumonia. The chronic bronchopneumonia may give rise to confusion with infectious anemia. The heave line, nasal discharge and intensity of vesicular breathing will confirm the diagnosis. Prognosis must be guarded. If the pulse remains above 70-80 for several days or if improvement does not set in after 5-6 weeks, the prognosis is unfavorable. Symptomatic treatment calls for cardiacs. The empiric methods of phlebotomy, turpentine injections and massage have proved valuable. Sodium sulphate is given to combat constipation.

Pneumonia of Colts Due to Diplococcus

Döll, Wilhelm. Untersuchungen über eine ansteckende Lungen-Brustfellentzündung bei Absatzfohlen. (Contagious pleuropneumonia in weaned colts.) Thesis, Bact. and Serum-Institute, Vet. Coll., Berlin, Germany. 1929.—Incubation is from 3-28 days. The symptoms are anorexia, cough, nasal catarrh, fever, weakness, inflammation of the visible mucous membranes, acceleration of pulse and respiration. The cause is assumed to be a gram-positive diplococcus, found in every case by the author. Duration of the acute stage 6-10 days, of the chronic stage 3-10 weeks. Mortality 6%. Death from it suffocation due to edema of the glottis. Prognosis in general is favorable. In addition to symptomatic treatment, the intravenous injection of Argochrom (Merck) gave satisfactory results.

Transmissible Fowl Leucosis

Engelbrecht-Holm, J. 1931. Bericht über einen neuen Stamm Hühnerleukose. (A new type of fowl-leucosis.) Zeitschr. f. Immunisätsf. u. exp. Therapie 73 (½): 126-136.

A new type of transmissible fowl-leucosis cultivated in 10 generations resulted in 100% transmission in the seventh generation. With the exception of the first generation it consisted exclusively of erythroleucotic cases. Transmission succeeded as well subcutaneously as intravenously. The author concludes that Furth is correct when he states that lymphatic leucosis in chickens is not to be considered as a leucosis, but as a disease not connected with fowl-leucemia. If these views are correct, the pathological picture of fowl-leucosis will by no means be as complicated as Ellermann assumed, because the lymphatic form must be excluded as being outside the disease entity. The two other forms, erythroleucosis and myeloleucosis,

are simply early and late manifestations of one and the same pathological process.

Fowl Leucosis in Chicks

Engelbrecht-Holm, J., and Rothe-Meyer, A. 1932. Ueber die Uebertragung der Hühnerleukose auf Küchen. (Transmission of fowl-leucosis to pullets.) Zeitschr. f. Immunitätsf. u. exp. Therapie, 74 (¾): 347-352.

The author succeeded in transmitting erythroleucotic fowl-leucemia to chicks, a few days old. A typical erythroleucosis developed in them. It corresponded essentially to the erythroleucosis of adult chickens. The development in the chicks, however, was accelerated and more intensified. The abnormal cells in the chicks reach greater numbers than in the adult chickens. The course of the disease in chicks is more rapid, too. The leucemia type used gave 100% positive results in the first three passages. In the fourth passage only 75% gave positive results, while of the fifth passage, at the time of the conclusion of the experiment, only one chick had died.

Serological Diagnosis of Anthrax

Ivanoff, K. 1932. Beitrag zur Gewinning von präcipitierendem anti-Milzbrandserum. (Production of a precipitating anti-anthrax serum.) Zeitschr. f. Hyg. u. Inf.-Krkh. 113 (2/3): 400-405.

When anthrax bacteria, killed with formalin, are injected intravenously, there occur, almost always, preciptins against anthrax bacteria in the serum of immunized animals, (rabbit, ass, horse). An efficient precipitating anti-anthrax serum, valuable for the seriological diagnosis of anthrax is procured by this method. The injection has to be made intravenously and with massive doses of the bacteria. In order to desensitize the animal body and to avoid anaphylactic reaction and death, a large dosage of bacteria should be injected subcutaneously, previous to each intravenous injection. Sheep are not adapted for the production of precipitating serum. Addition of 0.5% phenol is to be preferred to the addition of formalin for the preservation of the serum.

Blood Picture in Diseased Cattle

Büngener, F. Das Schillingsche Hämogramm kranker Rinder. (The Schilling blood picture in diseased cattle.) Thesis, 59 pp. Veterinary College, Hanover, 1928.

Normal gestation causes a moderate leucocytosis near the termination of pregnancy, culminating shortly after birth. When complications arise, the hyperleucocytosis becomes more pronounced. The blood picture of pathological puerperium shows leucocytosis, eosinopenia, lymphocytopenia and neutrophilia with shift to the left, the degree of the shift depending on the severity of the pathological stimulus. Cows with metritis show stages of the same pictures. The numeric values return with the return of convalescence. The eosinophiles will exceed even the normal. In acute disease processes of the digestive organs the author found eosinopenia, neutrophilia and lymphopenia. In severe cases, shift to the left occurs. Eosinophilia was found in acute parasitic diseases. Acute, severe tuberculosis shows hyperleucocytosis, eosinopenia, resp. aneosinophilia, relative lymphocytopenia, neutrophilia with shift of the nuclei; light forms of tuberculosis barely show changes of the blood picture. In cases of rickets, the author found lymphocytosis.

Cow Pox and Vaccinal Lesions of Milkers

Kaiser, M., and Weinfurter, F. 1931. Ueber Kuhpocken und vaccinale Melkererkrankungen. Zeitschr. f. Hyg. n. Inf.-Krkh. 113 (1): 192-205.

While it was not possible to prove with certainty that the disease among cows is connected with the protective vaccination of man against pox, yet, the predominance of its seasonal occurrence favors this view. The presence of pox among cows demands redress not only from the point of view of medical and veterinary sanitation, but also from purely agricultural and economic reason. The diseased animals cause infection of milkers. Many such infections had been diagnosed during the last few years. The disease in man may lead to incapacity for work or to lessened capacity for work, lasting for several weeks or even months. Milk coming from a diseased udder is inappetizing

and possibly infectious. Such cows are ill. Milking is painful to these animals. Their milkflow, likewise, is lessened. This disadvantage, too, forms an important economic problem, if the disease is of frequent occurrence. The prevention of such conditions is so simple and sure that it must be demanded for reasons of medical and veterinary hygiene. Moreover, the protective vaccination of the animals with the common protective pox-lymph is so cheap that no farmer should delay it. It is necessary to protectively vaccinate each newly acquired animal at once and to keep a record of the date of vaccination. The duration of immunity is not definitely known and further investigations are necessary. The disease in milkers occurs as a rule in three forms. The first form consists of typical vaccinal efflorescences which run their well known course. The second form consists of those vaccinal infections in which the vesicular or pustular stage does not necessarily need to occur. The disease runs its course without this phase in the form of a panaritium with lymphangitis, swelling, fever, and pain on the place of infection and in the arm pits. Medicinal treatment is not indicated. Moist heat applications seem to give relief. The third form consists of typical milker's nodules to which alone this name should be applied. Their nature and development give ground to the assumption of a double infection.

New Type of Rabies in South America

Kraus, R., and Duran, A. 1932. Ueber die in Südamerika vorkommenden Epidemien der Hundswut bei Rindern und Pferden. (Epidemic rabies among cattle and horses in South America.) Zeitschr. f. Immunitätsf. u. exp. Therapie 74 (½): 182-199.

In Brazil, Paraguay and Argentine occurs an epizootic disease among cattle, horses and mules which is characterized by pareses and which is caused by a neurotropic virus. The demonstration of Negri-bodies in the brain, the infectiousness of the brain and the course of the experimental disease, especially in rabbits and in dogs and demonstration of Negri-bodies in the brain of these animals gives reason to the assumption that the cause is a lyssa virus. Since several factors seem to be against the idea that the classical street-virus is involved, which is transmitted from the bite of a rabid animal, the assumption is justified to consider it a variety of the lyssa virus. In view of the already known varieties of the lyssa virus, it does not seem to be impossible that the virus of the "Mal de cadera de bovinos" forms a special variety. Further experiments will decide this question.

It appears from the experiments of Svirbely and Szent-Györgyi, two Hungarians, that vitamine C, the anti-scurvy vitamine, is the newly discovered hexuronic acid. This acid is found in pretty much the same vegetables and fruits as is vitamine C. It is also found in rather high concentration in the cortex of the suprarenal glands.

Menkin of the Harvard Medical School, has shown that the intravenous injection of ferric chloride will prolong the life of animals infected with tuberculosis. The iron accumulates in the tuberculous areas, and retards the development of tuberculous changes. While the animals eventually die of tuberculosis they live longer than tuberculous animals not receiving the iron injections.

Gregerson of the Harvard University Medical School, learned by experiment that the thirst that occurs one to two hours after eating is due to water withdrawn from the blood and tissues and used to increase the digestive fluids. Under ordinary conditions, a dog does almost all of his drinking within two or three hours after eating and during this time there is a marked reduction in the flow of saliva, but in four or five hours, the secretion of saliva returns to normal, even though the dog has had nothing to drink in the meantime. If the animal is deprived of drink for five to six hours after eating, the entire intake of water for the 24 hours is only one-fourth to one-half the amount usually consumed.